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By

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Prepared under NASA Contract Number NAS9-13247

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Chrysler Corporation Space Division
New Orleans, La. 70189

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REENTRY AERODYNAMIC CHARACTERISTICS OF A SPACE SHUTTLE SOLID ROCKET BOOSTER MODEL 449 TESTED IN MSFC 14 X 14 INCH TWT (SA26F)

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ABSTRACT

Two force tests of a 0.563 percent scale Space Shuttle Solid Rocket Booster (SRB) model, MSFC Model 449, were conducted at the Marshall Space Flight Center 14 x 14 inch Trisonic Wind Tunnel. These tests, TWT-590 and TWT-595 (combined under NASA Series No. SA26F), occupied the tunnel for a total of 76 hours during November 1973 and January 1974, respectively. There were a total of 134 runs (pitch polars) made. Test Mach numbers were 0.6, 0.9, 1 2, 1.96, 2.74, 3.48, 4.00, 4.45, and 4.96; test angles of attack ranged from -10 degrees to 190 degrees; test Reynolds numbers ranged from 4.9 million per foot to 7.1 million per foot; and test roll angles were 0, 45, 90, and 135 degrees. The model was tested with three different engine nozzle/skirts. Two of these engine configurations differed from each other in the magnitude of the volume inside the nozzle and skirt. The third engine configuration had part of the nozzle removed. The model was tested with an electrical tunnel in combination with separation rockets of two different heights.

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PLOTTED COEFFICIENTS SCHEDULE:

(A) CNM, CLMM, CA, XCP/L versus ALPHA

(B) DCNM, DCLMM, DCA, DXCP/L versus ALPHA

(C) CYM, CYNM, CBL, YCP/L versus ALPHA

(D) DCYM, DCYNM, DCBL, DYCP/L versus ALPHA

NOMENCLATURE

SYMBOL	PLOT SYMBOL	DEFINITION	UNITS
A_{b_1}		base areas	in.^{2}
AF		abbreviation for axial force	
b_{ref}	BREF	reference span (diameter of the cylindrical section of the model)	in.
C_A		total axial force coefficient in the body axis system	
C_{A_b}	CAB	base axial force coefficient (see text)	
C_{A_m}	CA	total axial force coefficient in the missile axis system, $F_{A_m}/q_\infty \ S_{ref}$	
C_ℓ		rolling moment coefficient in the body axis system	
C_{ℓ_m}	CBL	rolling moment coefficient in the missile axis system, $M_{X_m}/q_\infty \ S_{ref} \ \ell_{ref}$	
C_m		pitching moment coefficient in the body axis system	
C_{m_m}	CLMM	pitching moment coefficient in the missile axis system, $M_{Y_m}/q_\infty \ S_{ref} \ \ell_{ref}$	
C_N		normal force coefficient in the body axis system	
C_{N_m}	CNM	normal force coefficient in the missile axis system, $F_{N_m}/q_\infty \ S_{ref}$	
C_n		yawing moment coefficient in the body axis system	
C_{n_m}	CYNM	yawing moment coefficient in the missile axis system, $M_{Z_m}/q_\infty \ S_{ref} \ \ell_{ref}$	

SYMBOL	PLOT SYMBOL	DEFINITION	UNITS
$C_{P_{bi}}$		base pressure coefficient; $\frac{P_{bi} - P_\infty}{q_\infty}$	
C_Y		side force coefficient in the body axis system	
C_{Y_m}	CYM	side force coefficient in the missile axis system, $F_{Y_m}/q_\infty \ S_{ref}$	
δC_{A_m}	DCA	incremental axial force coefficient due to a specific difference in configuration	
δC_ℓ	DCBL	incremental rolling moment coefficient due to a specific difference in configuration	
δC_{m_m}	DCLMM	incremental pitching moment coefficient due to a specific difference in configuration	
δC_{N_m}	DCNM	incremental pitching moment coefficient due to a specific difference in configuration	
δC_{Y_m}	DCYM	incremental side force coefficient due to a specific difference in configuration	
δC_{m_m}	DCYNM	incremental yawing moment coefficient due to a specific difference in configuration	
	DSEPRT	parameter name describing the comparison of separation rocket height. The number 1.0 indicates that data from runs in which the S_2 rockets were mounted on the model were subtracted from data runs where the S_1 rockets were mounted	

SYMBOL	PLOT SYMBOL	DEFINITION	UNITS
$\delta X_{cp}/\ell_B$	DXCP/L	incremental longitudinal center of pressure location due to a specific difference in configuration	
$\delta Y_{cp}/\ell_B$	DYCP/L	incremental lateral center of pressure location due to a specific difference in configuration	
	ELT	parameter name describing the electrical tunnel. Number of 1.0 indicates an electrical tunnel is mounted on the SRB at an angular location as described by phi (ϕ). (Model roll angle is based on the position of electrical tunnel).	
F_{A_m}		total axial force in the missile axis system, positive in the negative direction of X_m	lb.
F_{N_m}		normal force in the missile axis system, positive in the negative direction of Z_m	lb.
F_{Y_m}		side force in the missile axis system, positive in the positive direction of Y_m	lb.
ℓ_{body}		length of body	in.
ℓ_{ref}	LREF	reference length (diameter of the cylindrical section of the model)	in.
M	MACH	Mach number	
M_{X_m}		rolling moment in the missile axis system, i.e., moment about the X_m-axis (a positive rolling moment tends to rotate the positive Y_m-axis toward the positive Z_m-axis	in.-lb

SYMBOL	PLOT SYMBOL	DEFINITION	UNITS
M_{Y_m}		pitching moment in the missile axis system; i.e., moment about the Y_m-axis (a positive pitching moment tends to rotate the positive Z_m-axis toward the positive X_m-axis)	in.-lb
M_{Z_m}		yawing moment in the missile axis system; i.e., moment about the Z_m-axis (a positive yawing moment tends to rotate the positive X_m-axis toward the positive Y_m-axis)	in.-lb
NF		abbreviation for normal force	
P_{b_i}		base pressures	psi
P_t		free stream total pressure	psi
P_∞		free stream static pressure	psi
PM		abbreviation for pitching moment	
q_∞		free stream dynamic pressure	psi
RM		abbreviation for rolling moment	
S_{ref}	SREF	reference area (cross sectional area of the cylindrical section of the model)	in.^{2}
SF		abbreviation for side force	
	SEPRKT	parameter name describing the separation rockets. The number 1.0 indicates that the S_1 rockets were mounted on the model. The number 2.0 indicates that the S_2 rockets were mounted	
T_t		tunnel total temperature	^{o}F

SYMBOL	PLOT SYMBOL	DEFINITION	UNITS
X_{CP}/ℓ_B	XCP/L	longitudinal center of pressure location in percent of body length from nose; $= \frac{XMRP}{\ell_{body}} - \left(\frac{C_{m_m}}{C_{N_m}}\right)\left(\frac{\ell_{ref}}{\ell_{body}}\right)$	
X_m, Y_m, Z_m		missile axes (see text)	
XMRP, YMRP, ZMRP	XMRP, YMRP, ZMRP	abbreviations for the location of the moment reference point in the missile axis system	in.
Y_{CP}/ℓ_B	YCP/L	lateral center of pressure location in percent of body length from nose; $= \frac{XMRP}{\ell_{body}} - \left(\frac{C_{n_m}}{C_{Y_m}}\right)\left(\frac{\ell_{ref}}{\ell_{body}}\right)$	
YM		abbreviation for yawing moment	
α_T	ALPHA	angle of attack, angle between the X_m-axis and a vector in the direction of the air flow	degrees
ϕ	PHI	roll angle; i.e., angle between the missile Y_m-axis and the body Y-axis (from a pilot's viewpoint in an airplane, a positive roll angle is a clockwise rotation). The plot symbol describes the specific protuberance angular location in degrees (see Figure 7)	degrees
	BETA	sideslip angle, body axis system, degrees	
	FWDSTK	parameter name describing the forward strake on the body; number in front of decimal is the number of strakes; number after decimal is the length of the strake in calibers	

SYMBOL	PLOT SYMBOL	DEFINITION
	AFTSTK	parameter name describing the aft strake on the body; number in front of decimal is the number of strakes; number after decimal is the length of the strake in calibers
	SHDSTK	parameter name describing the shroud strakes; number indicates the presence of eight strakes; number 0.000 indicates no strakes.
	ATHRNG	parameter name describing the attachment ring; number indicates the presence of the ring
	ATHS	parameter name describing attachment hardware; number indicates the presence of attachment hardware
	CONFIG	configuration code numbered as follows: 1--$NBRE_1A$ 2--$NBRE_1$ 3--$NBRE_1S_1ELT$ 4--$NBRE_1S_2ELT$ 5--$NBRE_1B$

SUBSCRIPTS

b	base
c.g.	center of gravity
i	identifies the location of the base pressure measurements
m	missile axis system
ref	reference conditions
t	total conditions
∞	free stream conditions

INTRODUCTION

The wind tunnel tests described herein are a continuation of a series of force tests (References 1, 2, 3, 4, and 5) conducted to evaluate the static aerodynamic stability of a Space Shuttle Solid Rocket Booster (SRB). All of these tests were designed to provide aerodynamic data under simulated reentry flight conditions of the SRBs after separation from the space shuttle launch configuration.

The model was tested with three different engine nozzle/skirt configurations. Two of these engine configurations differed from each other in the magnitude of the volume inside the nozzle and skirt. The third engine configuration had part of the nozzle removed. Separation rockets of two different heights, in conjunction with an electrical tunnel, were mounted on the model during some tests.

Test Mach numbers were 0.6, 0.9, 1.2, 1.96, 2.74, 3.48, 4.00, 4.45, and 4.96; test angles of attack ranged from -10 degrees to 190 degrees; test Reynolds numbers ranged from 4.9 million per foot to 7.1 million per foot; and test roll angles were 0, 45, 90, and 135 degrees.

MODEL AND SUPPORT HARDWARE

Model Description

The model, MSFC model 449, is a 0.563 percent scale model of a 142-inch diameter SRB. Details of this stainless steel model are presented in Table 3 and Figures 2, 3, 4, 5, 6, and 7. Figure 2 presents the dimensions of the major geometric body segments and the attachment ring. The attachment ring was a scaled representation of a structure used to attach the SRB to the Space Shuttle External Tank. The attachment ring was affixed to the model throughout the wind tunnel test.

Figures 3, 4, and 5 present the dimensions of the three engine nozzle/skirt configurations used during this test. The engine configurations differed in the extent of nozzle and skirt internal volume and in the length of the nozzle. They were used to investigate the effects of these variables on the aerodynamic static stability characteristics of the SRB.

Figures 6 and 7 present the dimensions of the separation rockets and the electrical tunnel. Figure 8 presents the location and roll sign convention of these protuberances. The separation rockets and the electrical tunnel are scaled representations of protuberances considered for use on the SRBs. They were used on the model only during selected parts of the test.

The model parts were given symbols to aid in identification of test configurations. These symbols are:

N	nose
B	cylindrical body
R	attachment ring
E_1	engine nozzle/skirt
E_{1A}	engine nozzle/skirt with deep cutouts inside skirt and nozzle
E_{1B}	engine nozzle/skirt E_{1A} with 64.2 inches (full scale) removed from nozzle exit
S_1	body and skirt mounted separation rockets, 44.75 inches (full scale) high
S_2	body and skirt mounted separation rockets, 22.375 inches (full scale) high
ELT	electrical tunnel mounted on cylindrical body in same plane with separation rockets

Some significant features of the design and construction of this model are:

- The model was made in three major sections: nose, body and engine nozzle/skirt
- Nose and engine can be switched end for end in order to test at angles of attack above 90 degrees.
- There are two cylindrical bodies. One is a solid cylinder and is used for a sting adapter mounted from the end. The other is made in two parts with an opening in the side so that it can be fitted around a side mount.
- Both bodies are mounted in the same position relative to the balance and maintain that position when the nose and engine nozzle/skirt are switched end for end.

- The attachment ring, which was affixed to the body throughout this test, has mounting locations on each end of both bodies so that it can maintain its position relative to the nose and engine.

- A slotted ring was necessary for certain side mount cases.

- Roll angles (applicable only when separation rockets and electrical tunnel are attached) were changed by rotating the nose section (to which the forward separation rockets were attached) to different angles, mounting the electrical tunnel at different locations on the body, and mounting the aft separation rockets at different locations on the skirt. The sign convention for roll angles is shown in Figure 8.

- The E_1 engine had a sting cavity through the center of its nozzle. This 0.625 inch diameter hole was closed with a plug whenever the model was not tail mounted to eliminate flow through the balance cavity.

- There were two noses. One was complete and the other had a 0.625 inch diameter hole through its center. This hole was necessary for sting passage when the model was nose mounted.

- Engine E_{1A} was destroyed when the aft 0.362 inch of the nozzle was removed to make E_{1B}.

Figure 9 is a photograph of a typical nose mount tunnel installation.

Support Hardware Description

Seven pieces of the MSFC double knuckle sting were used during this test. These are:

- Sting adapter no. 1
- Sting adapter no. 3
- Sting no. 1
- Sting no. 3

- Balance adapter no. 113
- Balance adapter no. 118
- Balance adapter extension no. 80M42509.

Table 4 lists the combinations of support hardware and associated angle of attack ranges used in this test.

The "sting adapters" (Figure 10) adapted the stings to the model support system of the test facility.

Using different mounting hole combinations, the "stings" (Figure 11) are adjustable in angle relative to both the sting adapters and the balance adapters.

The "balancing adapters" (Figures 12 and 13) connect the balance to the sting. No. 113 is a straight adapter and No. 118 (referred to as MSFC "sting" No. 118) has a 90 degree offset. When the straight adapter was used ($-10 \leq \alpha \leq 50$ degrees and $130 \leq \alpha \leq 190$ degrees), a one inch "balance adapter extension" (Figure 14) was used for proper tunnel position and adequate base clearance.

The two support hardware combinations used in these tests (end mount and side mount) are shown in Figures 15 and 16. The four ways that the model can be mounted on these two support hardware combinations are illustrated in Figures 17 and 18.

CONFIGURATIONS INVESTIGATED

The run schedule, i.e., data set collation sheet, for these tests, MSFC TWT 590/595, is shown in Table 2. This table contains the data set collation identifiers for the test and identifies the nominal conditions at which various configurations were tested. These conditions are angle of attack (α), roll angle (ϕ), and Mach number. Table 5 presents a summary of Table 2 and also lists the collective data set identifiers (several angle of attack ranges grouped together).

Configuration $NBRE_1$ was a 0.563 percent scale model of a 142 inch diameter SRB configuration, less electrical tunnel and nose attachment hardware (Figures 2 and 3). $NBRE_1$ was tested in TWT 578 (Reference 5) and referred to in that test as NBE_1. $NBRE_1$ was used as the basis for comparison for the other four configurations.

Configuration $NBRE_{1A}$ was made from $NBRE_1$ by replacing the nozzle/skirt with one that had a much more hollowed out skirt and nozzle (Figure 4).

Configuration $NBRE_{1B}$ was made from $NBRE_{1A}$ by removing the aft 64.2 inches (full scale) from the nozzle (Figure 5).

Configuration $NBRE_1S_1ELT$ was made from $NBRE_1$ by attaching separation rockets (Figure 6) and electrical tunnel (Figure 7). The separation rockets and electrical tunnel are positioned on the lee side of the SRB at zero roll angle and angle of attack between 0 and 180 degrees (Figure 8).

TEST FACILITY

The Marshall Space Flight Center 14" x 14" Trisonic Wind Tunnel is an intermittent blowdown tunnel which operates by high pressure air flowing from storage to either vacuum or atmospheric conditions. A Mach number range from .2 to 5.85 is covered by utilizing two interchangeable test sections. The transonic section permits testing at Mach 0.20 through 2.50, and the supersonic section permits testing at Mach 2.74 through 5.85. Mach numbers between .2 and .9 are obtained by using a controllable diffuser. The range from .95 to 1.3 is achieved through the use of plenum suction and perforated walls. Mach numbers of 1.44, 1.93 and 2.50 are produced by interchangeable sets of fixed contour nozzle blocks. Above Mach 2.50 a set of fixed contour nozzle blocks are tilted and translated automatically to produce any desired Mach number in .25 increments.

Air is supplied to a 6000 cubic foot storage tank at approximately -40°F dew point and 500 psi. The compressor is a three-stage reciprocating unit driven by a 1500 hp motor.

The tunnel flow is established and controlled with a servo-actuated gate valve. The controlled air flows through the valve diffuser into the stilling chamber and heat exchanger where the air temperature can be controlled from ambient to approximately 180°F. The air then passes through the test section which contains the nozzle blocks and test region.

Downstream of the test section is a hydraulically controlled pitch sector that provides a total angle of attack range of 20° (± 10°). Sting offsets are available for obtaining various maximum angles of attack up to 25°.

The diffuser section has movable floor and ceiling panels which are the primary means of controlling the subsonic Mach numbers and permit more efficient running supersonically. The sector assembly and supersonic diffuser telescope into the subsonic diffuser to allow easy access to the model and test section.

Tunnel flow is exhausted through an acoustically damped tower to atmosphere or into the vacuum field of 42,000 cubic feet. The vacuum tanks are evaluated by vacuum pumps driven by a total of 500 hp.

Data are recorded by a solid-state digital data acquisition system. The digital data are transferred to punched cards during the run to be reduced later by a computer to proper coefficient form.

DATA ACQUISITION AND REDUCTION

The parameters measured and recorded during this test were:

- Wind tunnel conditions (P_∞, P_t, T_t)
- Six-component force and moment data
- Sting attitude
- Base pressure ($-10 \leq \alpha \leq 50$ degrees only)

Tunnel conditions were used to calculate the Mach number, the dynamic pressure, and the Reynolds number (Table 1); the six-component force and moment data were used to calculate static stability coefficients; the sting attitude, nominal model attitude, and deflection calibrations were used to calculate the model angle of attack; and the base pressures were used to calculate base pressure coefficients.

Base pressures were recorded only over the angle of attack range from -10 to 50 degrees; i.e., only when the model was on a tail mounted sting. Figure 19 shows the location of the pressure tubes. A tabulation of the base pressure coefficients (Cp_{bi}) is included in the appendix to this report. Zeroes are listed where base pressures were not recorded.

As stated above, the six-component force and moment data were used to calculate six-component static stability coefficients. These data are listed in Table 1. The six coefficients, C_{A_m}, C_{ℓ_m}, C_{m_m}, C_{N_m}, C_{n_m}, and C_{Y_m}, are coefficients in the missile axis system.

The missile axis system (X_M, Y_M, Z_M) is a non-rolling body axis system that is frequently used in wind tunnel tests and studies of missile flight dynamics. It is a system of axes that rotates with a missile or wind tunnel model through angles of attack but never through angles of roll; i.e., it never rotates about the missile or model longitudinal axis. The orientations of the missile axes coefficients are defined in Figure 1. The missile axis system is identical with the body axis system at zero roll angle.

Six-component static aerodynamic coefficients in the missile axis system may be converted to coefficients in the body axis system with the following six equations:

$$C_A = C_{A_m}$$

$$C_N = C_{N_m} \cos \phi + C_{Y_m} \sin \phi$$

$$C_Y = -C_{N_m} \sin \phi + C_{Y_m} \cos \phi$$

$$C_\ell = C_{\ell_m}$$

$$C_m = C_{m_m} \cos \phi + C_{n_m} \sin \phi$$

$$C_n = -C_{m_m} \sin \phi + C_{n_m} \cos \phi$$

The following reference dimensions were used to calculate the static stability coefficients:

Parameter	Full Scale	Model Scale
Reference Area (S_{ref})		
based on body cross section	109.98 ft^2	0.503 $in.^2$

Parameter	Full Scale	Model Scale
Reference Length (ℓ_{ref}) = (b_{ref}) = model diameter	142 in.	0.800 in.
Moment Reference Center (from body nose)		
*XMRP	986.97 in.	5.547 in.
YMRP	0	0
ZMRP	0	0

The force and moment data were corrected for model weight tares but tunnel flow angularity was assumed to be zero.

DATA PRESENTATION

Data are presented in two forms: (1) aerodynamic static stability coefficients and center of pressure location are plotted as a function of angle of attack and (2) data tables are presented that include six static stability coefficients, two base pressure coefficients, wind tunnel flow conditions, and model attitude (angle-of attack and roll angle).

Data Plots

The plots of the static stability coefficients and center of pressure location are presented in the following groups:

---

*Note: XMRP (56.69% of total length without portion of nozzle removed, measured from nose tip)

- Aerodynamic characteristics of a Solid Rocket Booster ($NBRE_1$ at $M = 2.74$)
- Aerodynamic characteristics of a SRB with different engine nozzle/skirts (E_1, E_{1A} and E_{1B})
- Effect of truncated nozzle on SRB aerodynamic characteristics ($E_{1B} - E_{1A}$)
- Aerodynamic characteristics of a SRB with separation rockets and electrical tunnel (S_1)
- Aerodynamic characteristics of a SRB with separation rockets and electrical tunnel (S_2)
- Effect of separation rocket height ($S_1 - S_2$)

Table 6 presents, for each configuration or comparison of configurations, the coefficients which are plotted and the Mach numbers for which data are available.

Data Tables

Data tables, presented in the appendix as tabulated source data, are presented for each of the 134 runs that were made during these tests. They are presented in the order of data set number. Each table contains a listing of the six static aerodynamic stability coefficients. Two base pressure coefficients (Cp_{bi}) are listed. Values appear for those runs that had base pressures recorded, and zeroes appear for those runs that did not. Each table also includes information that describes the model configuration, the model attitude, the tunnel flow conditions, and model reference dimensions.

If base axial force coefficients are desired, the equation to be used is:

$$C_{A_b} = -\left[\frac{C_{p_{b_1}} \cdot A_{b_1}}{S_{ref}} + \frac{C_{p_{b_2}} \cdot A_{b_2}}{S_{ref}}\right]$$

Base pressure data were taken only during runs where the model was tail mounted. Configurations $NBRE_1$ and $NBRE_1S_1ELT$ were the only configurations tested in this manner. Their base areas are the same and are as follows:

A_{b_1} = 0.500 sq. in.

A_{b_2} = 0.419 sq. in.

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Table 1.

TEST: MSFC TWT 590/595

DATE: Jan., 1974

TEST CONDITIONS

MACH NUMBER	REYNOLDS NUMBER (10^6/ft)	DYNAMIC PRESSURE (pounds/sq. inch)	STAGNATION TEMPERATURE (degrees Fahrenheit)	STAGNATION PRESSURE (pounds/sq inch)
0.60	4.94	4.32	103	22
0.90	6.25	7.38	102	22
1.20	6.65	9.14	102	22
1.96	7.09	10.25	100	28
2.74	5.02	6.37	114	30
3.48	6.62	6.86	144	60
4.00	5.72	5.16	145	70
4.45	5.46	4.08	143	80
4.96	4.96	3.07	135	90

BALANCE UTILIZED: MSFC 237

	CAPACITY:	ACCURACY:	COEFFICIENT TOLERANCE:
NF	200 lbs		
SF	100 lbs		
AF	20 lbs		
PM	196 in.-lbs		
RM	98 in.-lbs		
YM	50 in.-lbs		

COMMENTS:

Table 2.

TEST : MSFC TWT 590 (SA26F)

DATA SET/RUN NUMBER COLLATION SUMMARY

DATE : NOVEMBER 1975

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES				NO. OF RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)									
		α	β	∅					0.6	0.9	1.2	1.96	2.74	3.48	4.00	4.45	4.95	
R95001	$NBRE_{1A}$	I	0	0				3							2/0	3/0	4/0	
002		IR						1						1/1				
003		J						3							19/0	18/0	17/0	
004		JR						1						20/0				
005		KR1						4						7/0	11/0	13/0	15/0	
006		KR2						4						8/0	12/0	14/0	16/0	
007		KR4						1						10/0				
008		KR3						1						9/0				
009	$NBRE_1$	IR						1						5/1				
010		JR						1						21/0				
011		KR						1						6/0				

TEST RUN NUMBERS

1	7	13	19	25	31	37	43	49	55	61	67	75 76
CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CPb1	CPb2	MACH	ALPHA	1.0
						COEFFICENTS				IDVAR (1)	IDVAR (2)	NDV

α OR β SCHEDULES SEE TABLE 4.

Table 2. (Continued)

TEST: MSFC TWT 590 (SA26F)

DATA SET/RUN NUMBER COLLATION SUMMARY

DATE: NOVEMBER 1973

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	PARAMETERS/VALUES Ø				NO. OF RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE) 0.6	0.9	1.2	1.96	2.74	3.48	4.00	4.45	4.96	TEST RUN NUMBERS
R95012	NBRE₁S₁ELT	B	O	45				5	28/0	29/0	30/0	51/0		27/0				
013				90				5	33/0	32/0	31/0	50/0		26/0				
014				135				5	34/0	35/0	36/0	49/0		25/0				
015		D		45				4	73/0	74/0	75/0	52/0						
016				90				5	90/0	89/0	88/0	57/0		103/0				
017				135				5	91/0	92/0	93/0	58/0		102/0				
018		F		45				5	78/0	77/0	76/0	53/0		107/0				
019				90				5	85/0	86/0	87/0	56/0		104/0				
020				135				5	96/0	95/0	94/0	59/0		101/0				
021		H		45				4	64/0	65/0	66/0	63/0						
022				90				4	69/0	58/0	67/0	62/0						
023				135				4	70/0	71/0	72/0	61/0						
024		J		45				5	45/0	44/0	43/0	46/0		22/0				
025				90				5	40/0	41/0	42/0	47/0		23/0				
026				135				5	39/0	38/0	37/0	48/0		24/0				
027	NBRE₁S₂ELT	F		45				5	79/0	80/0	81/0	54/0		106/0				
028				90				5	84/0	83/0	82/0	55/0		105/0				
029				135				5	97/0	98/0	99/0	60/0		100/0				

1 7 13 19 25 31 37 43 49 55 61 67 75 76

IDVAR (1) IDVAR (2) NDV

COEFFICENTS

α OR β SCHEDULES SEE TABLE 4.

Table 2. (Continued)

TEST : MSFC TWT 590(SA26F)

DATA SET/RUN NUMBER COLLATION SUMMARY

DATE : NOVEMBER 1973

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	PARAMETERS/VALUES ∅				NO. OF RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE) 0.6	0.9	1.2	1.96	2.74	3.48	4.00	4.45	4.96	
R95030	NBRE$_{1A}$	IJ1	0	0				1						108/c				
031		IJ2						1						109/c				
032		IJ3						1						110/c				
033		IJ						1								111/c		
034		I						1					113/0					
035		J						1					114/0					
036		K						1					115/0					
037		IJ						1					112/0					
038	NBRE$_1$	C						1					118/0					
039		A						1					116/0					
040		B						1					117/0					

TEST RUN NUMBER

1 7 13 19 25 31 37 43 49 55 61 67 75 76

COEFFICENTS IDVAR (1) IDVAR (2) NDV

α OR β SCHEDULES SEE TABLE 4.

Table 2. (Concluded)

TEST: MSFC TWT595(SA26F)

DATA SET/RUN NUMBER COLLATION SUMMARY

DATE: JANUARY 1974

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	PARAMETERS/VALUES Ø				NO. OF RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE) 0.6	0.9	1.2	1.96	2.74	3.48	4.00	4.45	4.96	
R95050	NBRE$_{IB}$	G	0	0				3	12/1	13/1	14/1							
051		H						2		16/0	15/0							
052		I						4				11/0	4/0	5/0			6/0	
053		J						4				10/0	3/0	2/0			1/0	
054		K						3					9/0	8/0			7/0	

TEST RUN NUMBERS

1 7 13 19 25 31 37 43 49 55 61 67 75 76

COEFFICENTS

IDVAR (1) IDVAR (2) NDV

α OR β SCHEDULES SEE TABLE 4.

Table 3.

MODEL DIMENSIONAL DATA

MODEL COMPONENT: Nose-N

GENERAL DESCRIPTION: 142 inch SRB nose, cone angle is 18° with a spherical radius nose cap. (The nose was cut to allow for sting mounting when angle of attack exceeded 130°).

DRAWING NUMBER:

DIMENSIONS:	THEORETICAL FULL-SCALE	MODEL SCALE
Length	188.0 in.	1.059 in.
Max. Width	142 in.	0.8 in.
Max. Depth	142 in.	0.8 in.
Fineness Ratio	1.32	1.32
Area		
Max. Cross-Sectional	109.98 ft^2	0.503 in.^2
Planform		
Wetted		
Base	109.98 ft^2	0.503 in.^2
Length When Drilled for Sting Mounting (see Figure 6)		0.271 in.

Table 3. (Continued)

MODEL COMPONENT: BODY - B

GENERAL DESCRIPTION: 142 inch diameter SRB body (this body was cut on its side for sting mounting for angles of attack from 50° to 130°)

DRAWING NUMBER: 80M32577
80M32579
80M42619

DIMENSIONS:	THEORETICAL FULL-SCALE	MODEL SCALE
Length	1407.8 in.	7.931 in.
Max. Width	142 in.	0.8 in.
Max. Depth	142 in.	0.8 in.
Fineness Ratio		
Area		
Max. Cross-Sectional	109.98 ft^2	0.503 in.
Planform		
Wetted		
Base	109.98 ft^2	0.503 in.

Table 3. (Continued)

MODEL COMPONENT: Attachment Ring - R

GENERAL DESCRIPTION: An attachment ring (used to attach SRB to ET) is located 1.127 inches model scale (200 inches full scale) forward of the shroud flare.

DRAWING NUMBER:

DIMENSIONS:	THEORETICAL FULL-SCALE	THEORETICAL MODEL SCALE	ACTUAL MEASURED MODEL SCALE
Length			
Max. Width	10.3 in.	0.058 in.	
Max. Depth	10.6 in.	0.059 in.	
Fineness Ratio			
Area			
Max. Cross-Sectional			
Planform			
Wetted			
Base			

Table 3. (Continued)

MODEL COMPONENT: Engine Nozzle/Skirt - E_1

GENERAL DESCRIPTION: 142 inch diameter SRB engine nozzle/skirt combination. Both are symmetrical with the SRB body and were cut to allow for sting mounting for angles-of-attack -10 to 50°. The model was hollowed ~1/8 inch inside the skirt and 0.867 inches inside the nozzle to simulate full scale.

DRAWING NUMBER:

DIMENSIONS:	THEORETICAL FULL-SCALE	MODEL SCALE
Engine Skirt		
Flare Angle	15°03'	15°03'
Length	93 in.	0.524 in.
Max. Width	192 in.	1.082 in.
Max. Depth	192 in.	1.082 in.
Max. Cross Sectional Area	201.1 ft^2	.920 $in.^2$
Engine Nozzle		
Exposed Length	52.2 in.	0.294 in.
Max. Width	141.6 in.	0.798 in.
Max. Depth	141.6 in.	0.798 in.
Base Area	109.52 ft^2	0.500 $in.^2$

Table 3. (Continued)

MODEL COMPONENT: Engine Nozzle/Skirt - E_{1A}

GENERAL DESCRIPTION: 142 inch diameter SRB engine nozzle/skirt combination. Both are symmetrical with the SRB body. The model was hollowed 0.524 inches inside the skirt and 1 1/4 inches inside the nozzle to simulate full scale.

DRAWING NUMBER:

DIMENSIONS:	THEORETICAL FULL-SCALE	MODEL SCALE
Engine Skirt		
Flare Angle	15°03'	15°03'
Length	93 in.	0.524 in.
Max. Width	192 in.	1.082 in.
Max. Depth	192 in.	1.082 in.
Max. Cross Sectional Area	201.1 ft^2	.920 $in.^2$
Engine Nozzle		
Exposed Length	52.2 in.	0.294 in.
Max. Width	141.6 in.	0.798 in.
Max. Depth	141.6 in.	0.798 in.
Base Area	109.52 ft^2	0.500 $in.^2$

Table 3. (Continued)

MODEL COMPONENT: Engine Nozzle/Skirt - E_{1B}

GENERAL DESCRIPTION: 142 inch diameter SRB engine nozzle/skirt combination. Both are symmetrical with the SRB body and were cut to allow for sting mounting for angles of attack -10 to 50°. The model was hollowed 0.524 inches inside the skirt and 0.888 inches inside the nozzle to simulate full scale.

DRAWING NUMBER: ____________

	THEORETICAL	
DIMENSIONS:	FULL-SCALE	MODEL SCALE
Engine Skirt		
Flare Angle	15°03'	15°03'
Length	93 in.	0.524 in.
Max. Width	192 in.	1.082 in.
Max. Depth	192 in.	1.082 in.
Max. Cross Sectional Area	201.1 ft^2	0.920 $in.^2$
Engine Nozzle		
Depth Inside Skirt	12 in.	0.068 in.
Max. Width	109.6 in.	0.617 in.
Max. Depth	109.6 in.	0.617 in.
Base Area	65.52 ft^2	0.299 $in.^2$

Table 3. (Continued)

MODEL COMPONENT: Separation Rockets - S_1

GENERAL DESCRIPTION: Two separation rocket pods (used to separate the SRB from the external tank) mounted in line with one another, one on the cylindrical body just behind the nose and the other on the engine skirt.

DRAWING NUMBER: 80M32621

DIMENSIONS:	THEORETICAL FULL-SCALE	THEORETICAL MODEL SCALE
Length	72.8 in.	0.410 in.
Max. Width	13.0 in.	0.073 in.
Max. Depth	44.7 in.	0.252 in.
Fineness Ratio		
Area		
Max. Cross-Sectional		
Planform		
Wetted		
Base		

Table 3. (Continued)

MODEL COMPONENT: Separation Rockets - S_2

GENERAL DESCRIPTION: Two separation rocket pods (used to separate the SRB from the external tank) mounted in line with one another, one on the cylindrical body just behind the nose and the other on the engine skirt.

DRAWING NUMBER:

DIMENSIONS:	THEORETICAL FULL-SCALE	THEORETICAL MODEL SCALE
Length	72.8 in.	0.410 in.
Max. Width	13.0 in.	0.073 in.
Max. Depth	22.4 in.	0.126 in.
Fineness Ratio		
Area		
Max. Cross-Sectional		
Planform		
Wetted		
Base		

Table 3. (Concluded)

MODEL COMPONENT: Electrical Tunnel - ELT

GENERAL DESCRIPTION: The electrical tunnel runs along the outside of the SRB cylindrical body to protect the various electrical cables from aerodynamic loading.

DRAWING NUMBER:

	THEORETICAL	
DIMENSIONS:	FULL-SCALE	MODEL SCALE
Length	~1274 in.	~7.12 in.
Max. Width	13 in.	0.073 in.
Max. Depth	6 in.	0.034 in.
Fineness Ratio		
Area		
Max. Cross-Sectional		
Planform		
Wetted		
Base		

Table 4. SUPPORT HARDWARE COMBINATIONS

α SCHEDULE	α SWEEP (deg)	STING ADAPTER			STING NO.	BALANCE ADAPTER		BALANCE ADAPTER EXTENSION	NOSE
		ADAPTER NO.	HOLE NO.	ADAPTER POSITION		ADAPTER NO.	HOLE NO.		
A	-10 to 10	1	53	7.5 in.	1	113	1	80M42509	FWD
B	10 to 30		57				3		
C	30 to 50		54				4		
D	50 to 70	3	63	3.5 in.	3	118*	A-3	—	UP
F	80 to 100		61				A-1	—	
G	110 to 90						B-5	—	DOWN
H	130 to 110		63				B-6	—	
I	150 to 130	1	54	7.5 in.	1	113	4	80M42509	AFT
IR	150 to 130 to 150								
IJ	157 to 137		52						
IJ1	157 to 152								
IJ2	151.5 to 147								
IJ3	146.5 to 137								
J	170 to 150		51				3		
JR	170 to 150 to 170								
K	190 to 170		53				1		
KR	190 to 170 to 190								
KR1	190 to 180								
KR2	180 to 170								
KR3	170 to 180								
KR4	180 to 190								

MSFC Sting No. 118

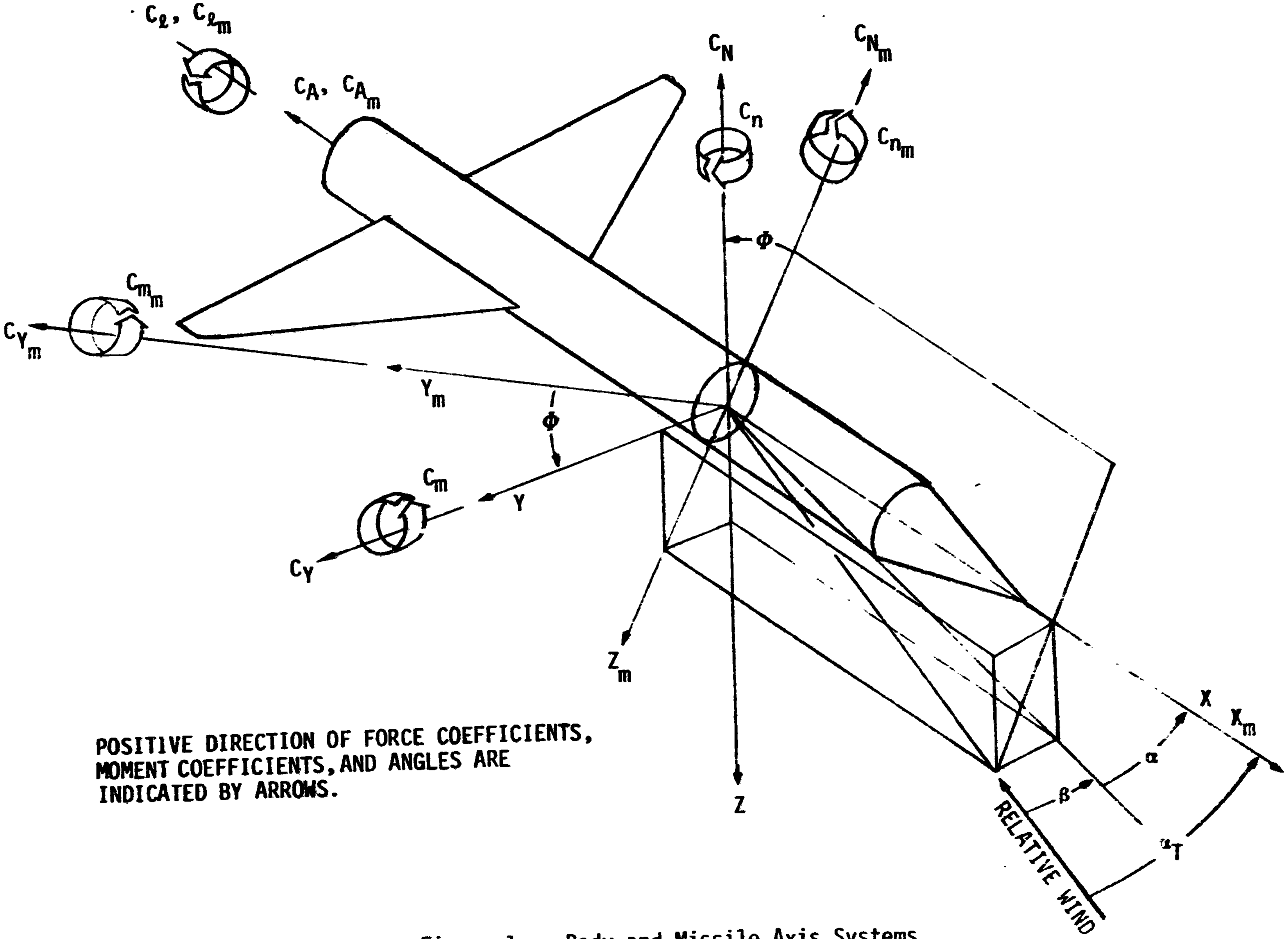
Table 5. TEST SUMMARY

COLLECTIVE DATA SET IDENTIFIER	INDIVIDUAL DATA SET IDENTIFIERS	CONFIGURATION SYMBOLS	ROLL ANGLE (ϕ) (DEGREES)	ANGLE OF ATTACK RANGE* (DEGREES)	MACH NUMBER RANGE
R95055	R95050 through R95054	$NBRE_{1B}$	-	90 to 190	0.6 to 4.96
R95101	R95001 through R95006 and R95034 through R95036	$NBRE_{1A}$	-	130 to 190	2.74 to 4.96
R95102	R95009 through R95011	$NBRE_1$	-	↓	3.48
R95103	R95012,015,018,021, and 024	$NBRE_1S_1ELT$	45	10 to 170	0.6 to 3.48
R95104	R95013,016,019,022, and 025	↓	90	↓	↓
R95105	R95014,017,020,023, and 026	↓	135	↓	↓
R95106	R95038 through R95040	$NBRE_1$	-	-10 to 50	2.74

*Not all Mach numbers had tests at the full angle of attack range. See Tables 2 and 4 for details.

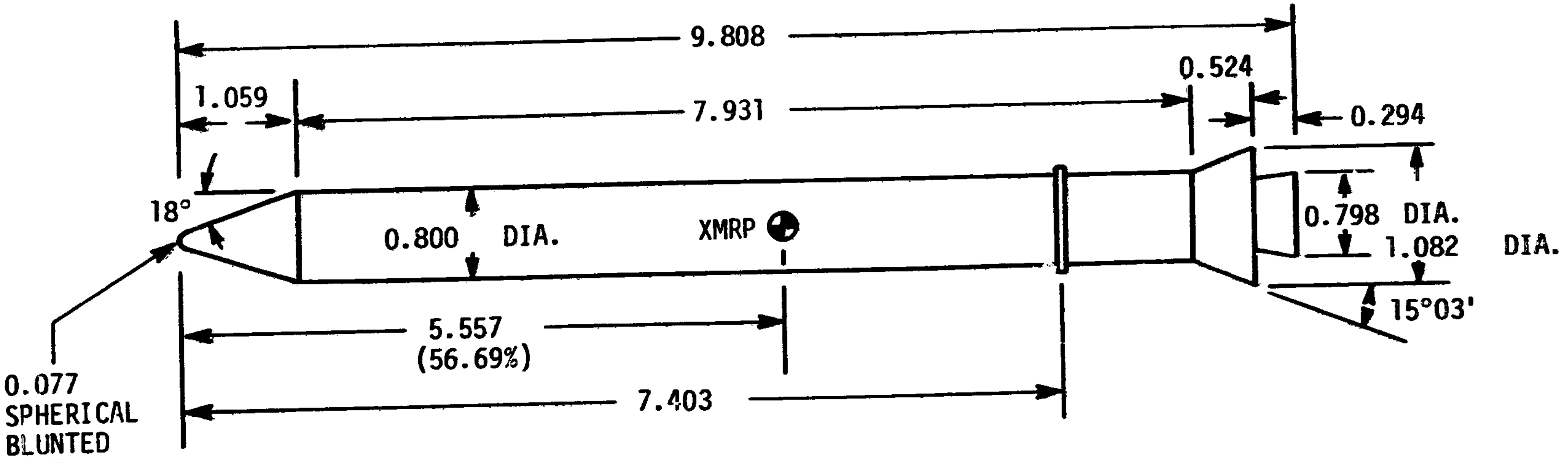
Table 6. PLOT SUMMARY

	COEFFICIENTS								MACH NUMBERS								
INVESTIGATION	CNM	CLMN	CA	XCP/L	CYM	CYNM	CBL	YCP/L	0.6	0.9	1.2	1.96	2.74	3.48	4.00	4.45	4.96
$NBRE_1$ at M = 2.74	X	X	X	X									X				
Different engine nozzle/ skirts	X	X	X	X					X	X	X	X	X	X	X	X	X
Effect of truncated nozzle	X	X	X	X									X	X			X
SRB with separation rocket S_1	X	X	X	X	X	X	X	X	X	X	X	X		X			
SRB with separation rocket S_2	X	X	X	X	X	X	X	X	X	X	X	X		X			
Effect of separation rocket height	X	X	X	X	X	X	X	X	X	X	X	X		X			

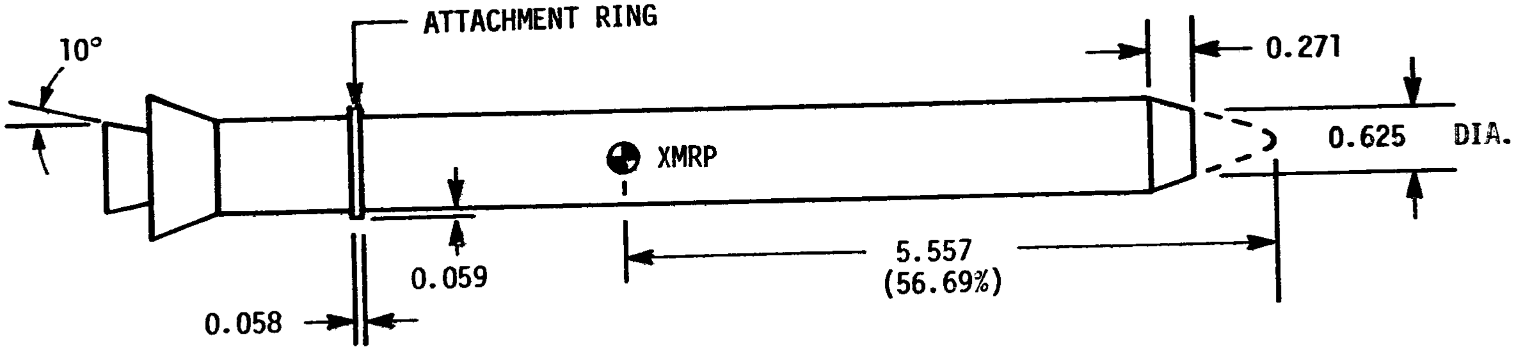

C_ℓ, C_{ℓ_m}
C_A, C_{A_m}
C_N
C_n
C_{N_m}
C_{n_m}
Φ
C_{m_m}
C_{Y_m}
Y_m
Φ
C_m
Y
C_Y
Z_m
Z
X
X_m
α
β
α_T
RELATIVE WIND

POSITIVE DIRECTION OF FORCE COEFFICIENTS, MOMENT COEFFICIENTS, AND ANGLES ARE INDICATED BY ARROWS.

Figure 1. - Body and Missile Axis Systems


9.808
1.059
7.931
0.524
0.294
18°
0.800 DIA.
XMRP
0.798 DIA.
1.082 DIA.
15°03'
5.557
(56.69%)
7.403
0.077
SPHERICAL
BLUNTED
NOSE

REAR AND SIDE MOUNT

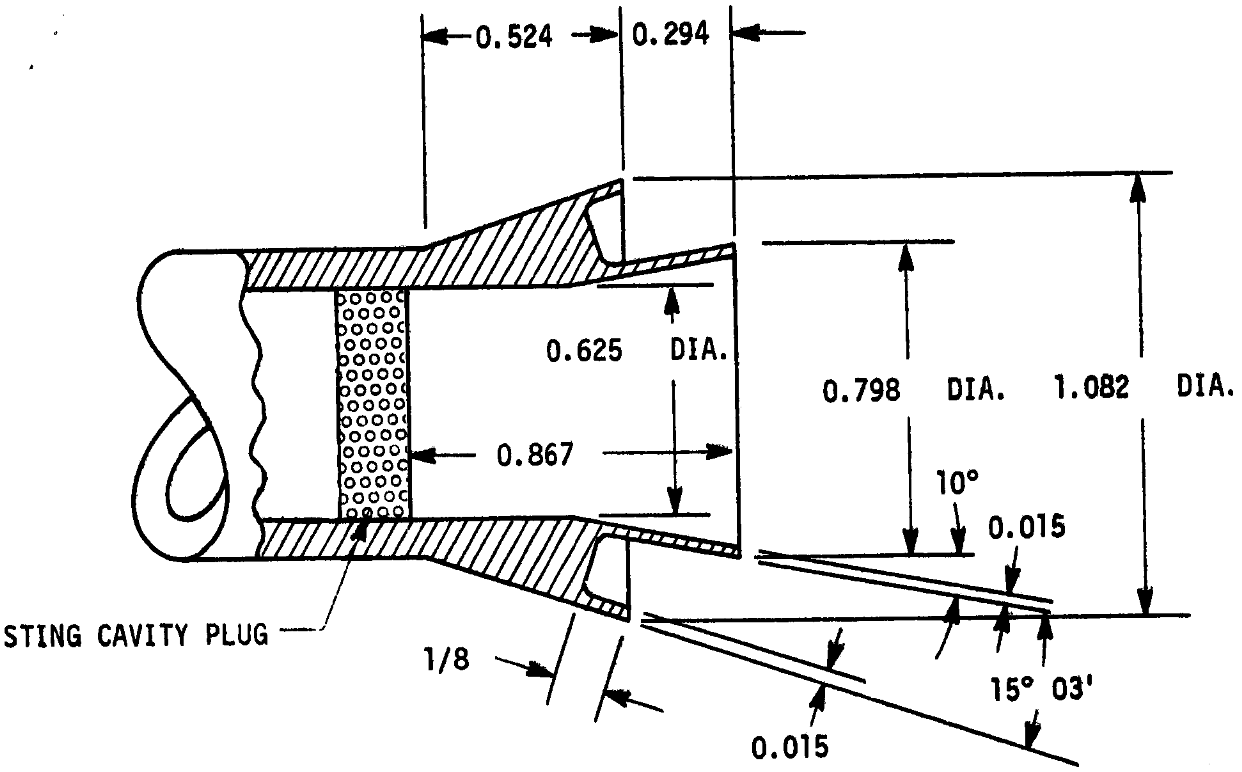

ATTACHMENT RING
10°
0.271
0.625 DIA.
XMRP
0.059
0.058
5.557
(56.69%)

YMRP = 0
ZMRP = 0

NOSE MOUNT

(ENGINE NOZZLE/SKIRT SYMMETRICAL WITH BODY)

Figure 2. 0.00563 SCALE 142-INCH SRB GEOMETRY (MSFC MODEL 449) (NOZZLE/SKIRT E_1)



0.524
0.294
0.625 DIA.
0.798 DIA.
1.082 DIA.
0.867
10°
0.015
STING CAVITY PLUG
1/8
15° 03'
0.015

Figure 3. ENGINE NOZZLE/SKIRT E_1

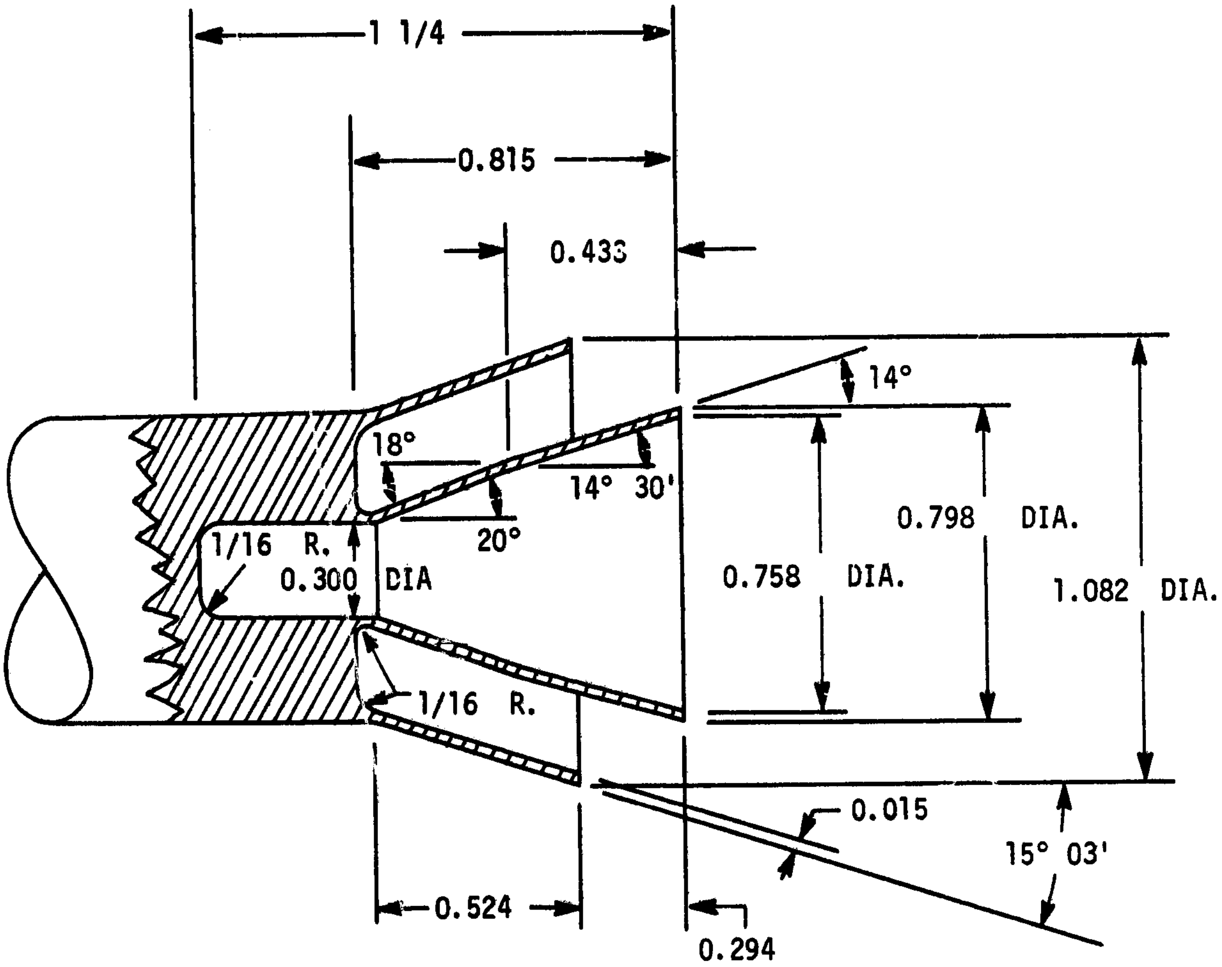

1 1/4
0.815
0.433
14°
18°
14° 30'
20°
0.798 DIA.
1/16 R.
0.300 DIA
0.758 DIA.
1.082 DIA.
1/16 R.
0.015
15° 03'
0.524
0.294

Figure 4. ENGINE NOZZLE/SKIRT E_{1A}

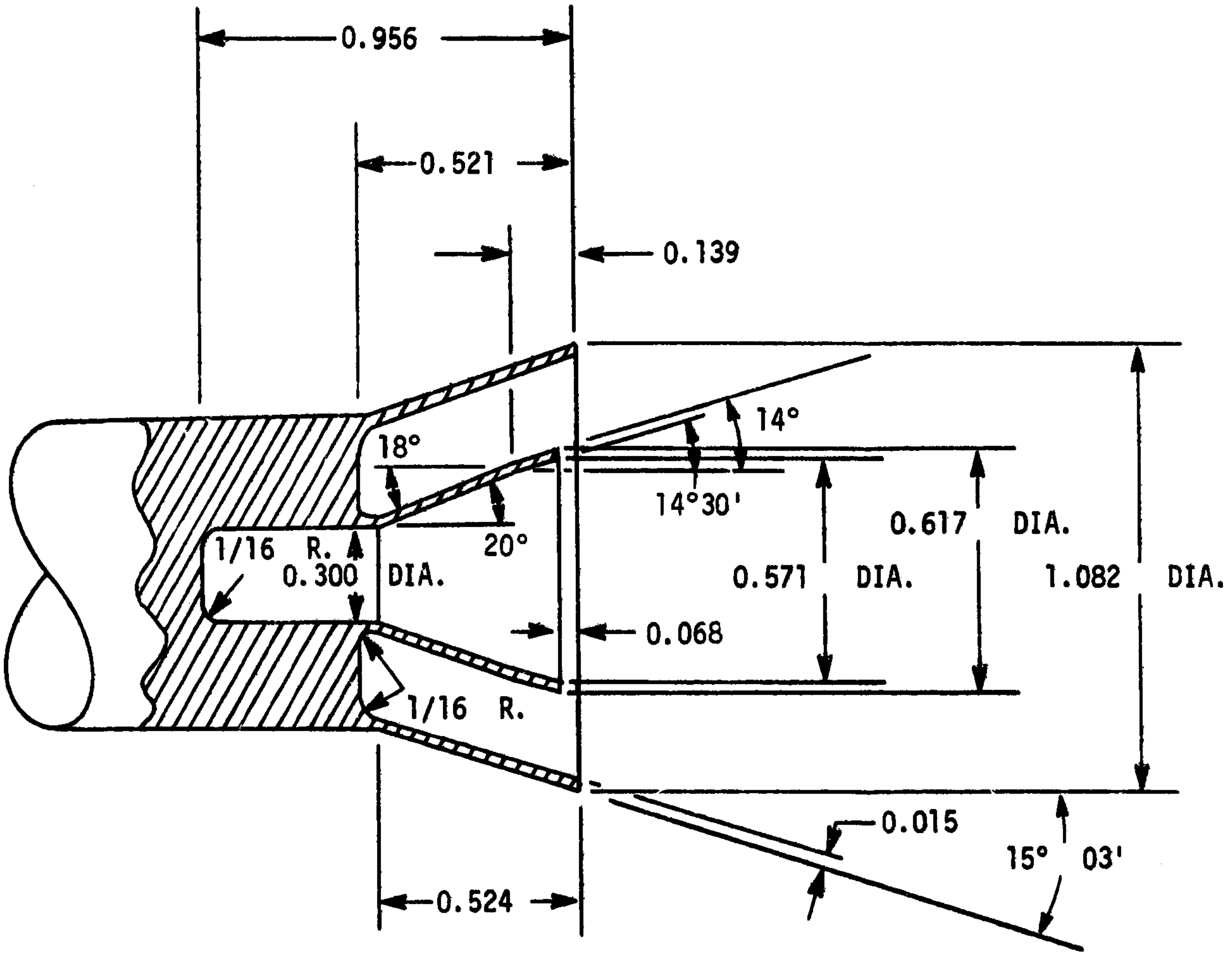
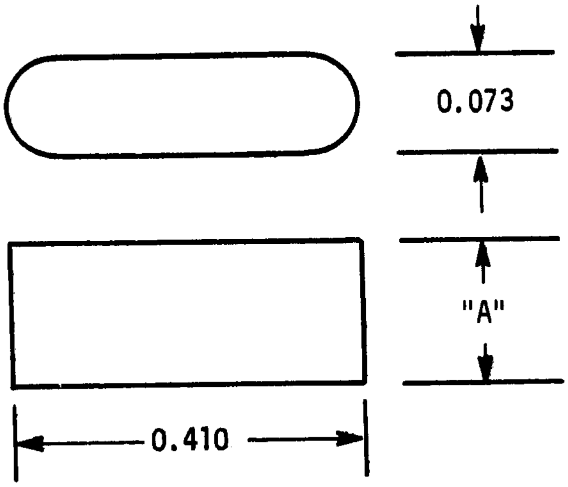

0.956
0.521
0.139
14°
18°
14°30'
0.617 DIA.
20°
1/16 R.
0.300 DIA.
0.571 DIA.
1.082 DIA.
0.068
1/16 R.
0.015
15° 03'
0.524

Figure 5. ENGINE NOZZLE/SKIRT E_{1B}



MODEL PART	"A"
S_1	0.252 In
S_2	0.126 In

Figure 6. SEPARATION ROCKETS

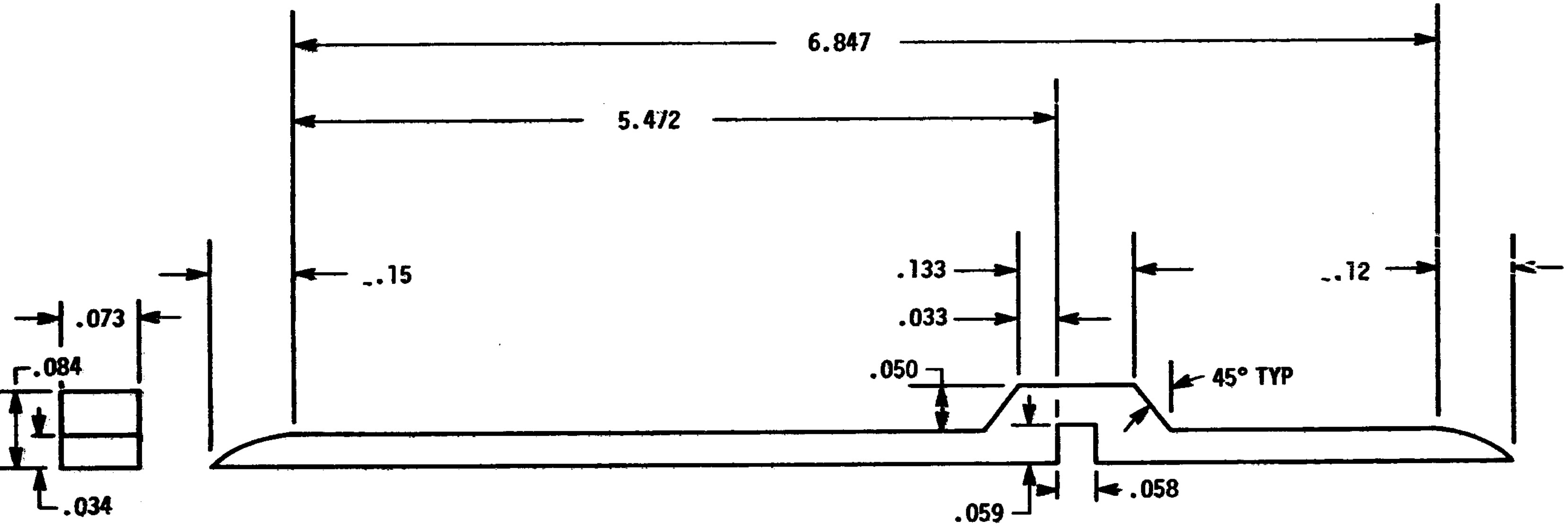

6.847
5.472
-.15
.133
.033
-.12
.050
45° TYP
.059
.058
.073
.084
.034

Figure 7. ELECTRICAL TUNNEL (ELT)

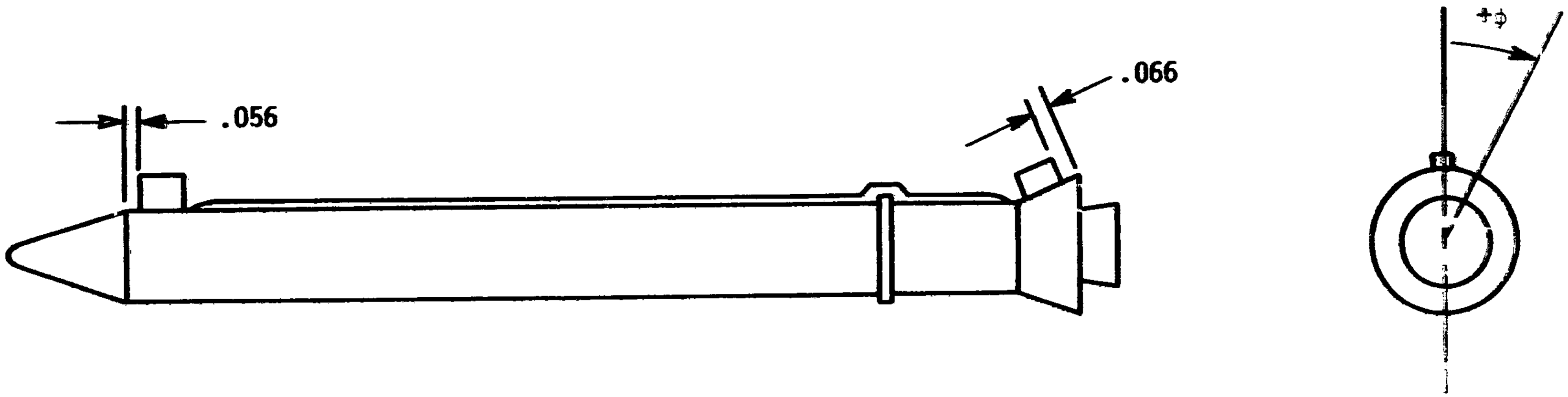


Figure 8. INSTALLATION OF SEPARATION ROCKETS AND ELECTRICAL TUNNEL

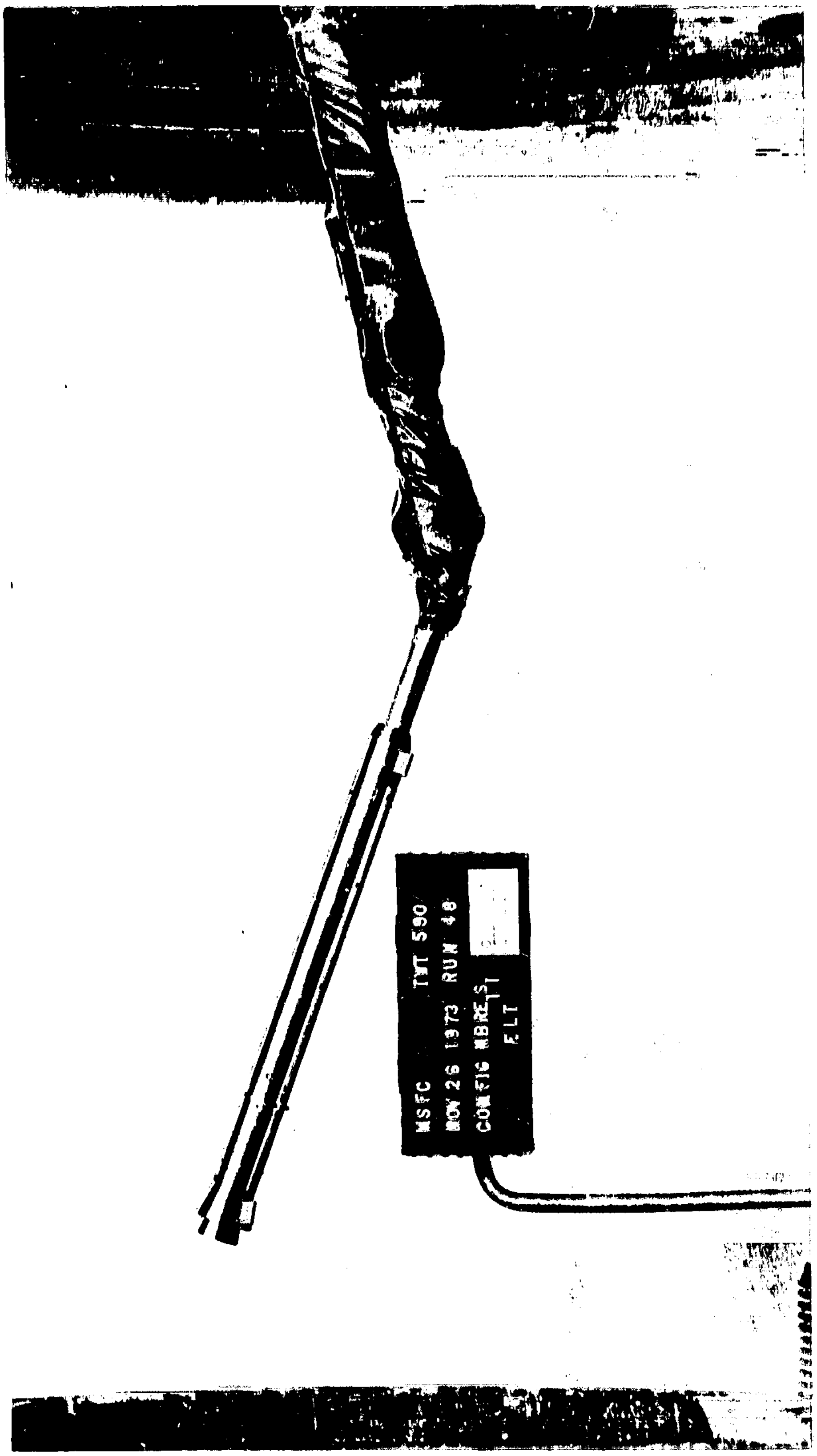

MSFC TWT 590
NOV 26 1973 RUN 48
CONFIG MBRE S T1
FLT

Figure 9. TYPICAL NOSE MOUNT INSTALLATION

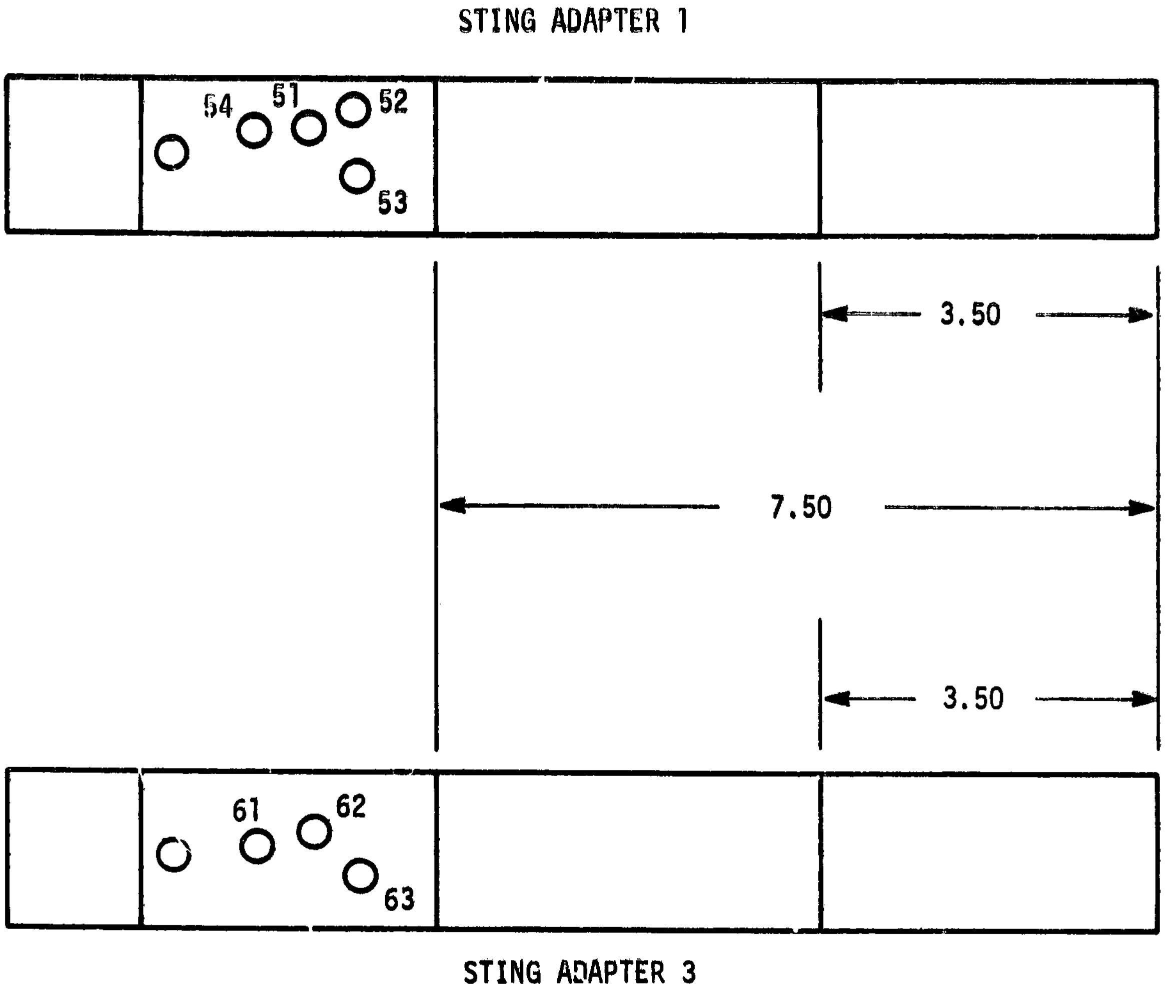

STING ADAPTER 1
54
51
52
53
3.50
7.50
3.50
61
62
63
STING ADAPTER 3

Figure 10. STING ADAPTERS

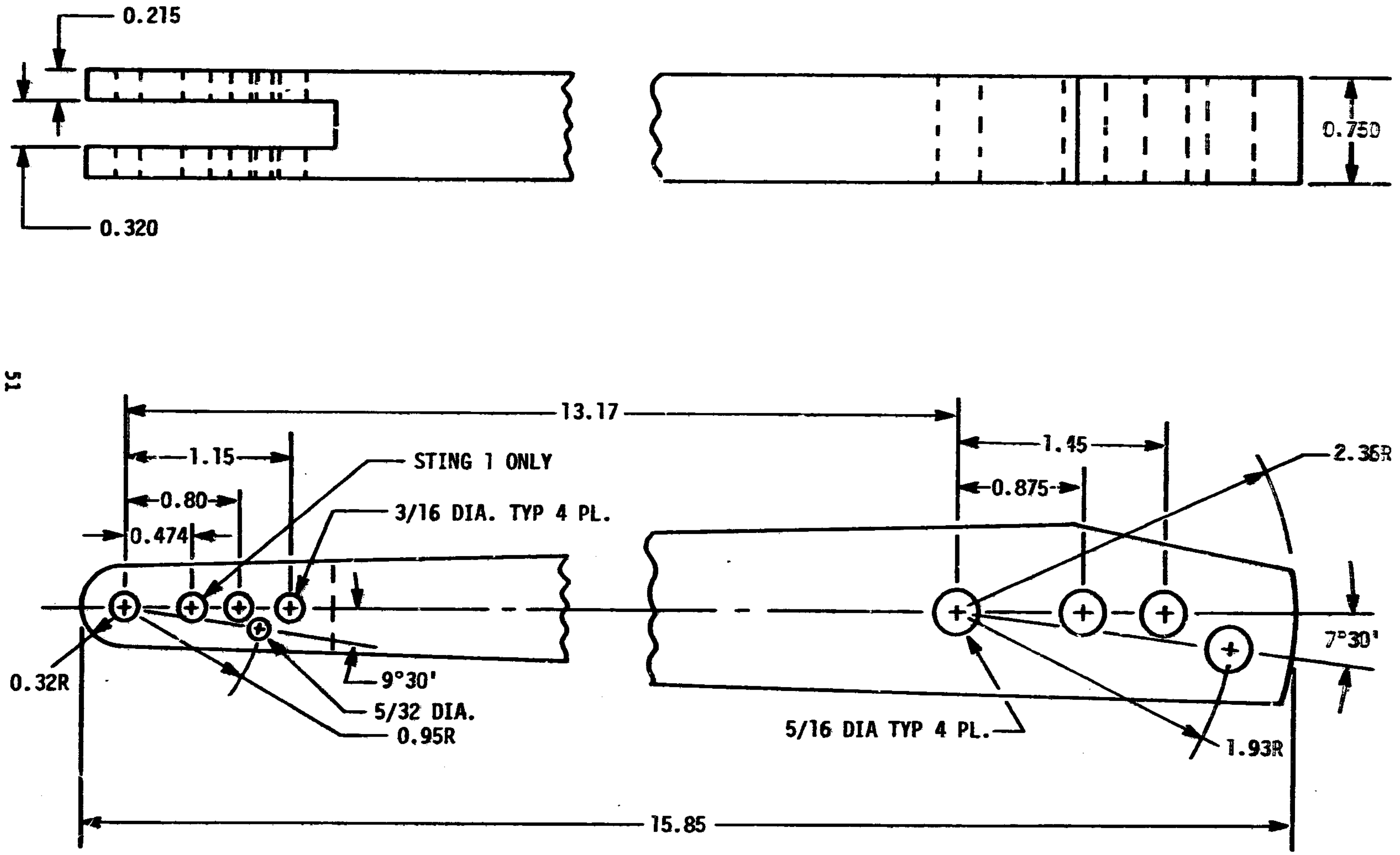
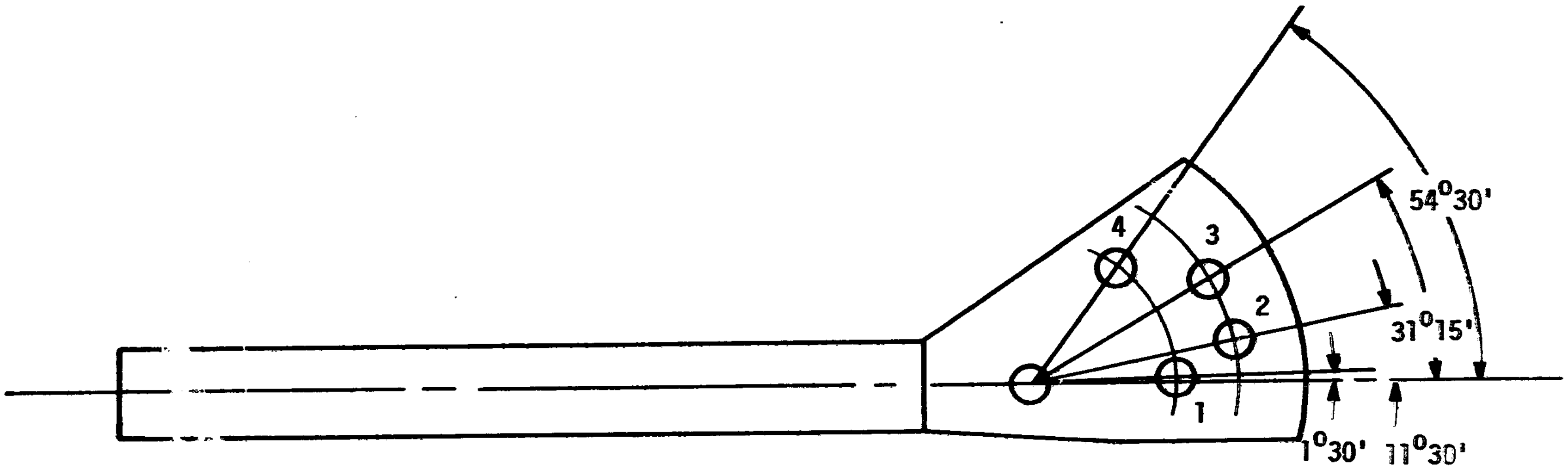
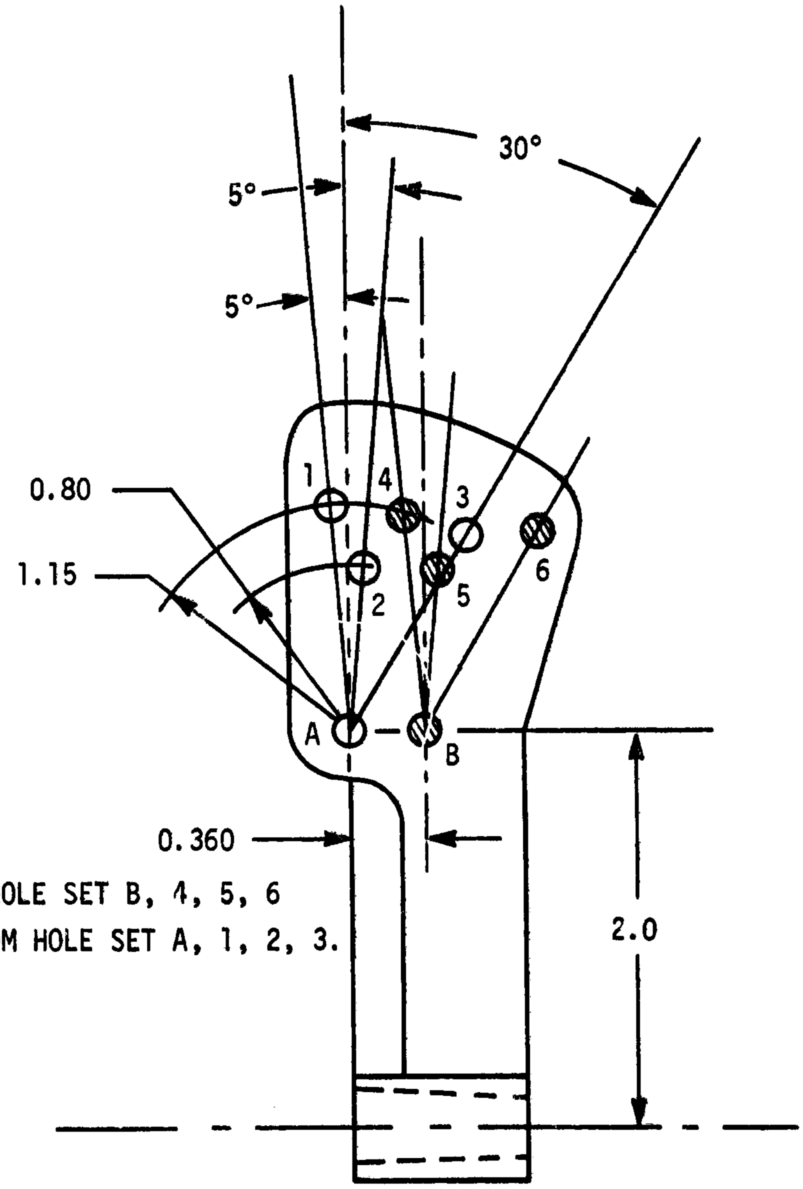

0.215
0.320
0.750
13.17
1.15
0.80
0.474
STING 1 ONLY
3/16 DIA. TYP 4 PL.
0.32R
9°30'
5/32 DIA.
0.95R
1.45
0.875
2.36R
7°30'
5/16 DIA TYP 4 PL.
1.93R
15.85

Figure 11. STINGS 1 & 3



54°30'
31°15'
1°30'
11°30'
1
2
3
4

Figure 12. BALANCE ADAPTER 113 (FROM MSFC DWG. NO. 80M42541)


30°
5°
5°
0.80
1.15
1
4
3
2
5
6
A
B
0.360
2.0

NOTE: ALTERNATE HOLE SET B, 4, 5, 6
SHIFTED 0.360" FROM HOLE SET A, 1, 2, 3.

HOLES A-2 AND B-5 RADIUS = 0.80
HOLES A-1, 3 AND B-4, 6 RADIUS = 1.15

Figure 13. BALANCE ADAPTER 118 (MSFC STING NO. 118 FROM MSFC DRAWING 80M42582)

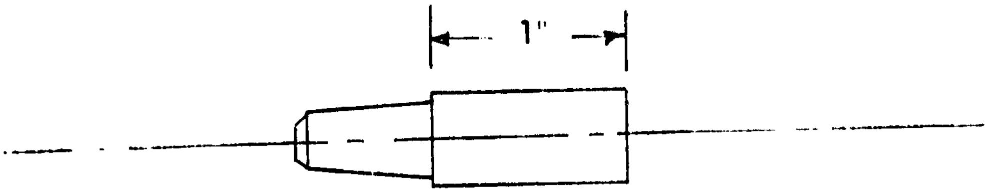
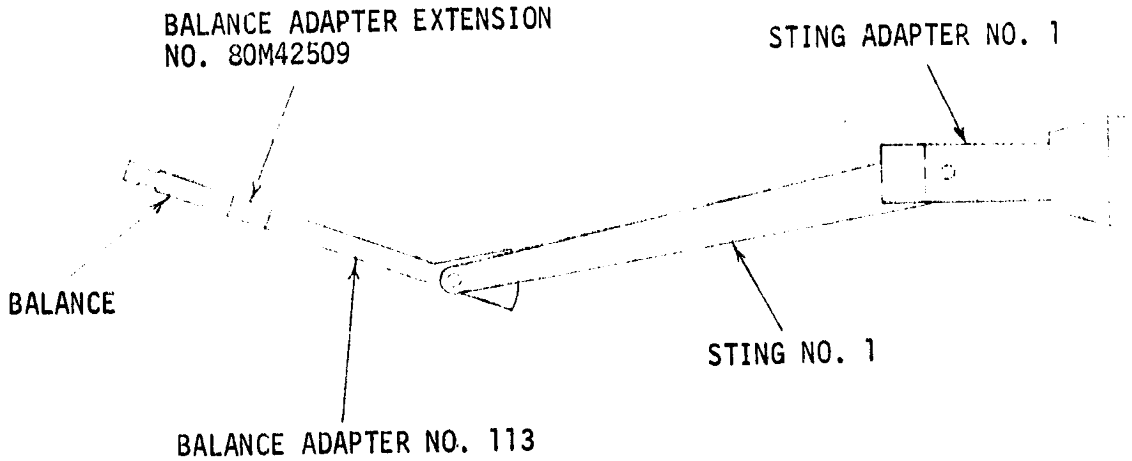


Figure 14. BALANCE ADAPTER (FROM MSFC DWG. NO. 80M42509)


BALANCE ADAPTER EXTENSION
NO. 80M42509
STING ADAPTER NO. 1
BALANCE
STING NO. 1
BALANCE ADAPTER NO. 113

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

Figure 15. SUPPORT SETUP-END MOUNT

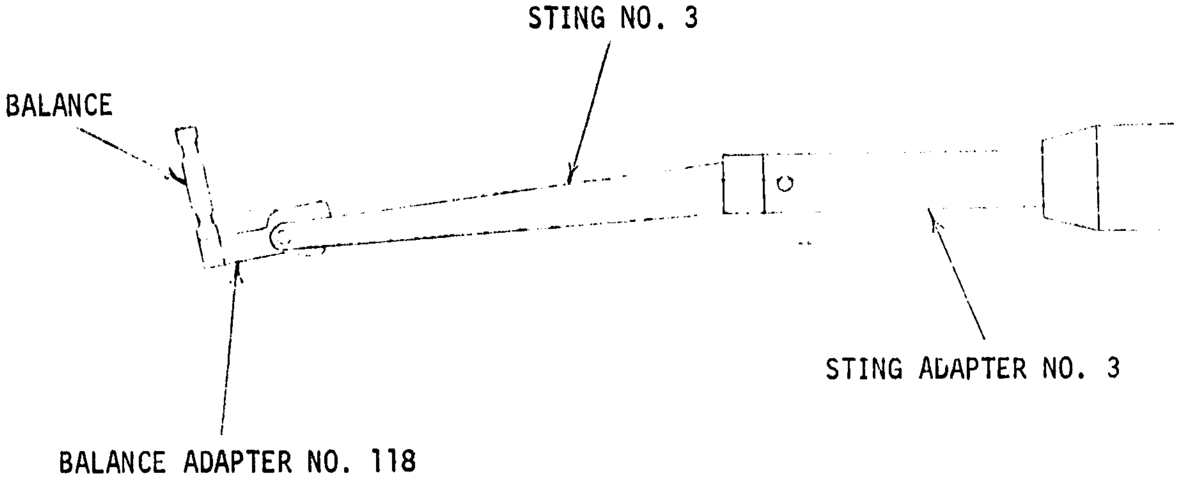

STING NO. 3
BALANCE
STING ADAPTER NO. 3
BALANCE ADAPTER NO. 118

Figure 16. SUPPORT SETUP-SIDE MOUNT

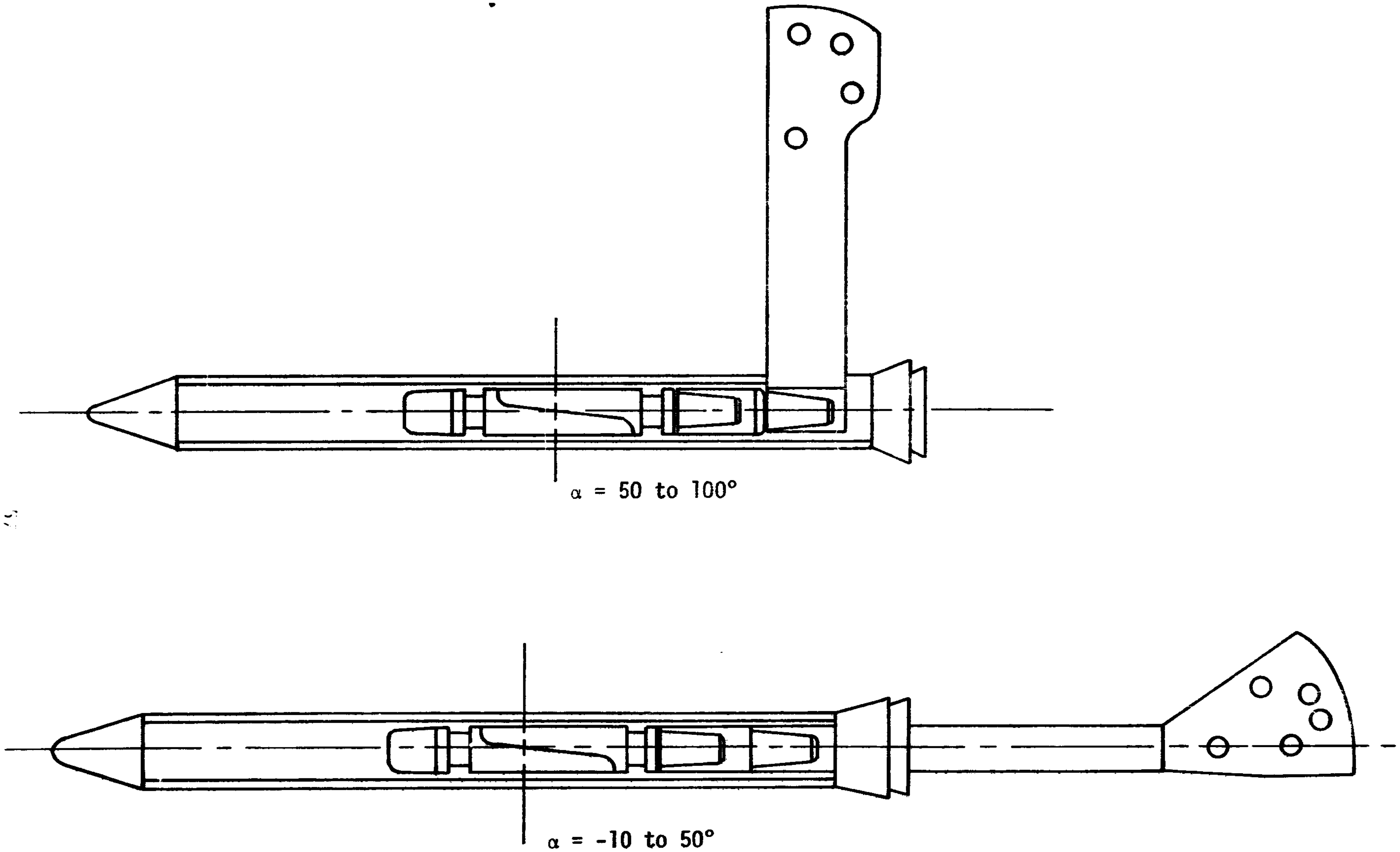

α = 50 to 100°
α = -10 to 50°

Figure 17. MOUNTING ARRANGEMENTS FOR ANGLE OF ATTACK - 10 to 100 DEGREES

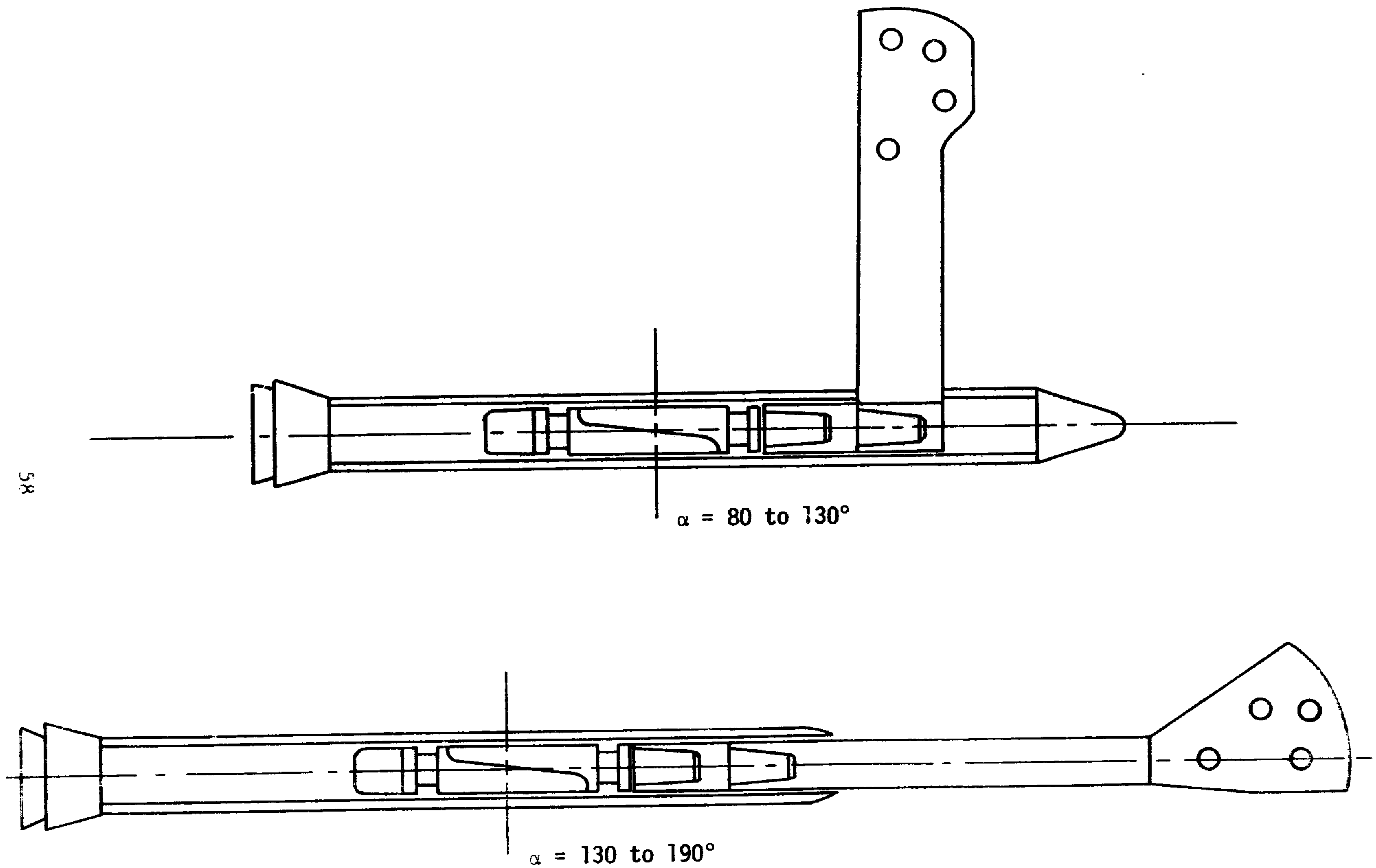

α = 80 to 130°
α = 130 to 190°

Figure 18. MOUNTING ARRANGEMENTS FOR ANGLE OF ATTACK 80 to 190 DEGREES

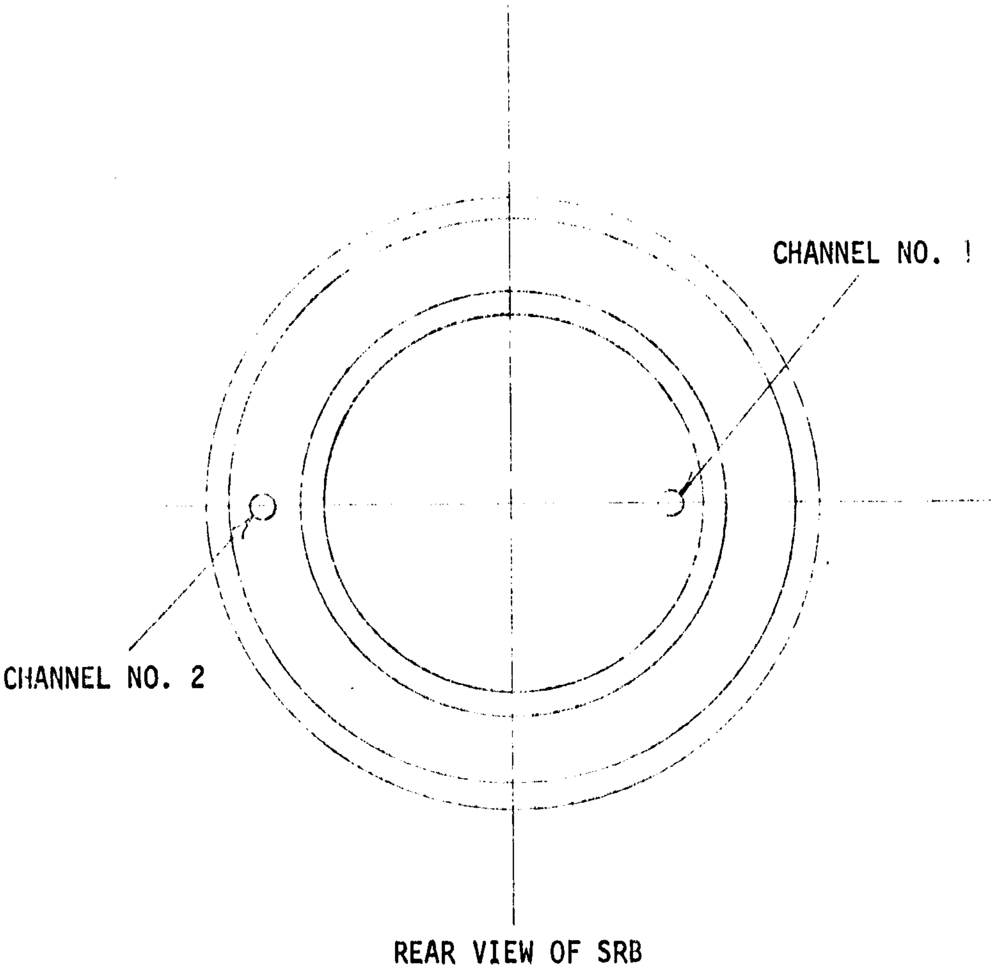
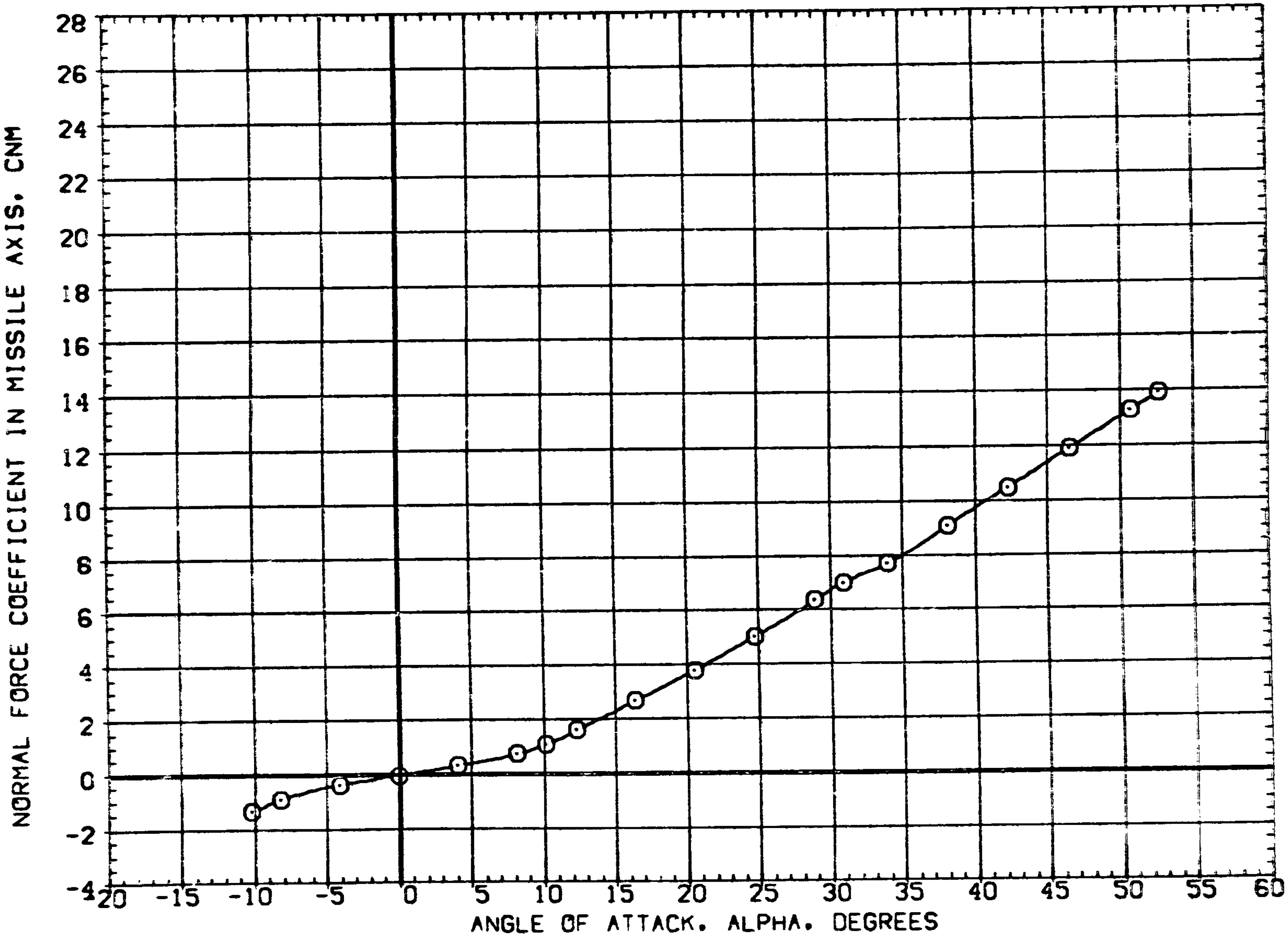

CHANNEL NO. 1
CHANNEL NO. 2
REAR VIEW OF SRB

Figure 19. BASE PRESSURE LOCATIONS

DATA FIGURES

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRKT
(A95106)	○	MSFC 590(SA26F) 142-IN. SRB(139) NBRE)	.000	.000	.000	.000

REFERENCE	INFORMATION	
SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	



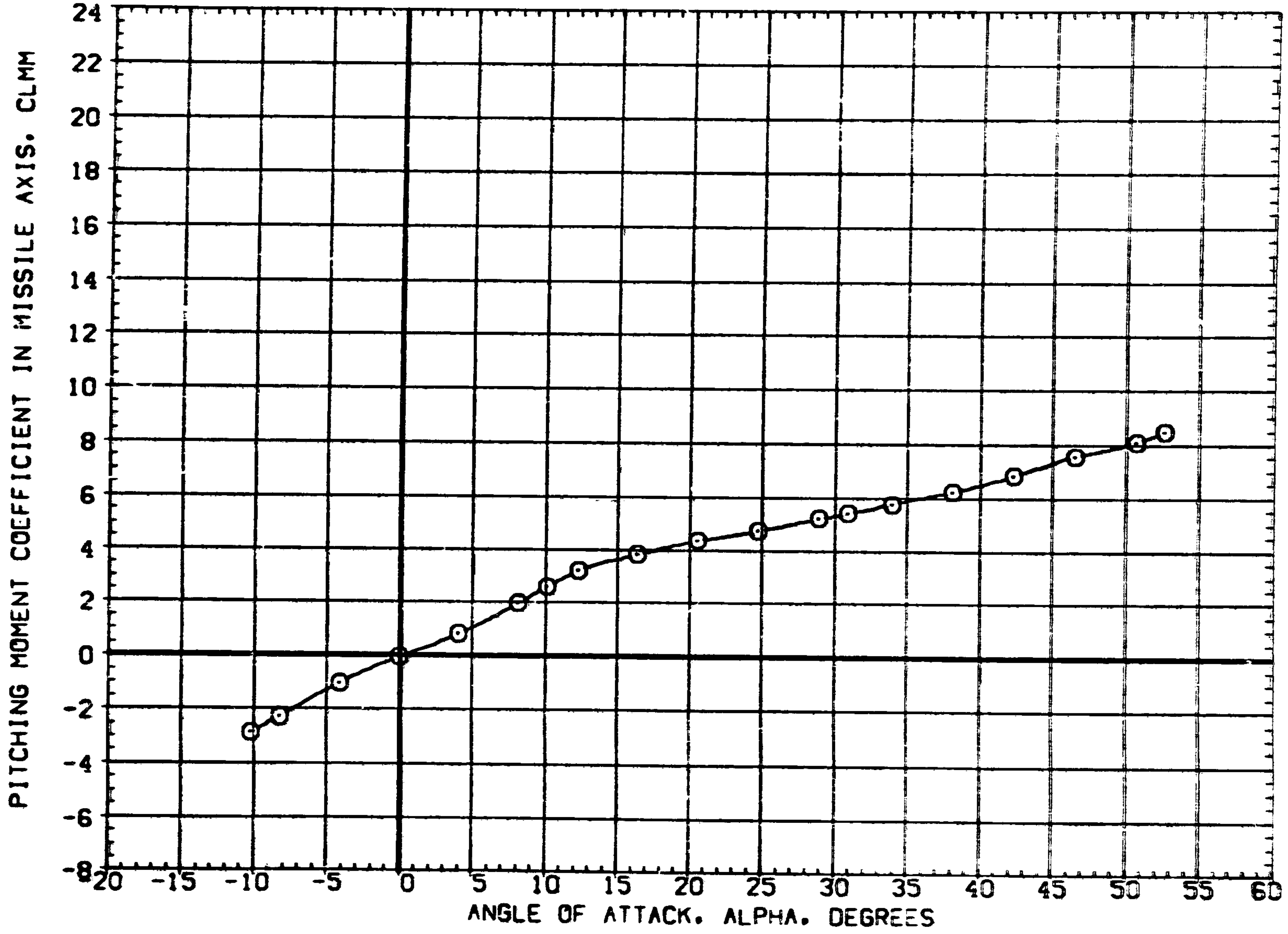
AERODYNAMIC CHARACTERISTICS OF A SOLID ROCKET BOOSTER

(A)MACH = 2.74

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRKT
[A95106]	○	MSFC 590(SA26F) [42-IN. SRB(139) NBRE]	.000	.000	.000	.000

REFERENCE INFORMATION

SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	



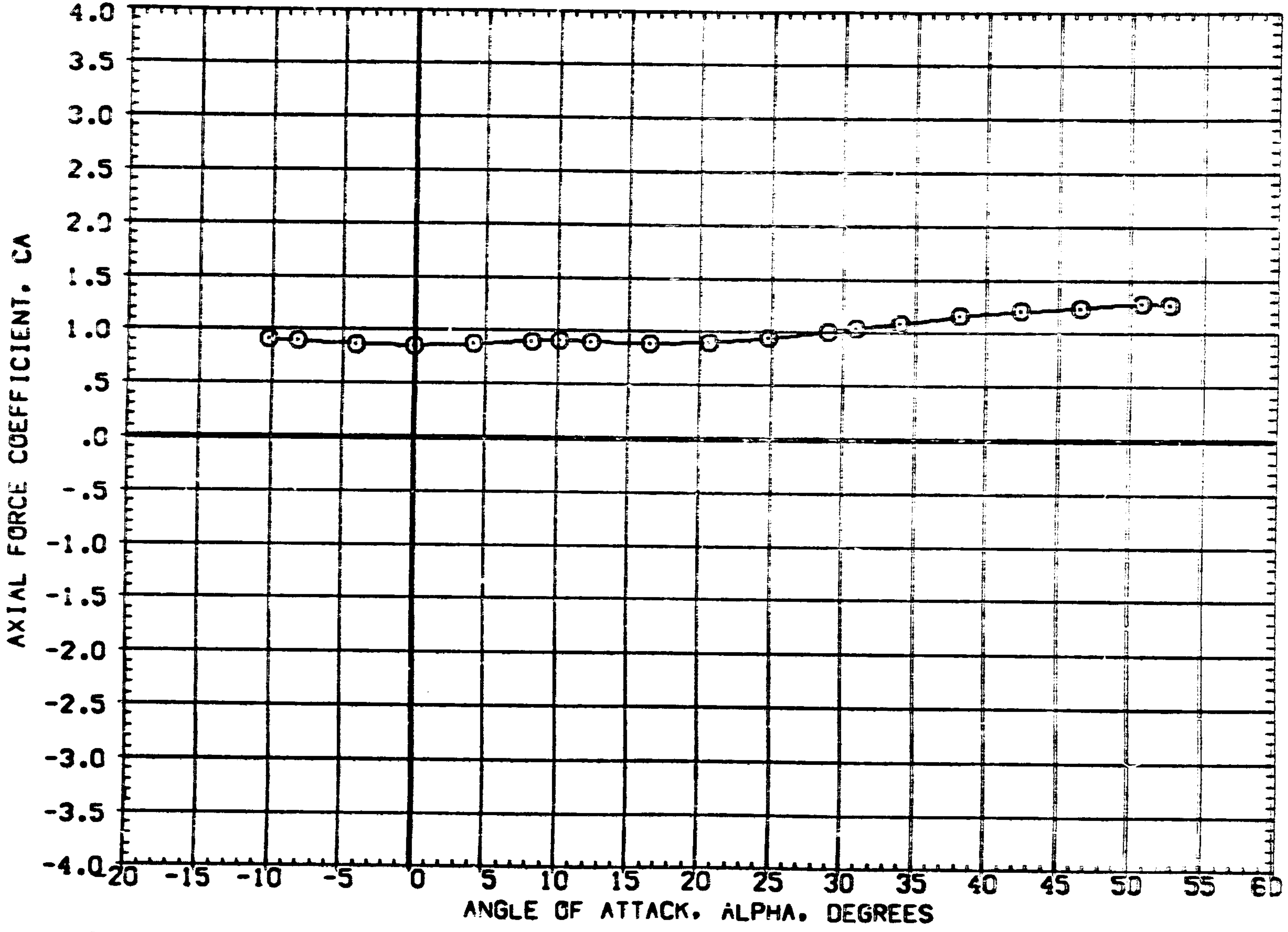
AERODYNAMIC CHARACTERISTICS OF A SOLID ROCKET BOOSTER

(A)MACH = 2.74

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRKT
(AS5106)	○	MSFC 590(SA26F) 142-IN. SRB(139) NBRE1	.000	.000	.000	.000

REFERENCE INFORMATION

SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	

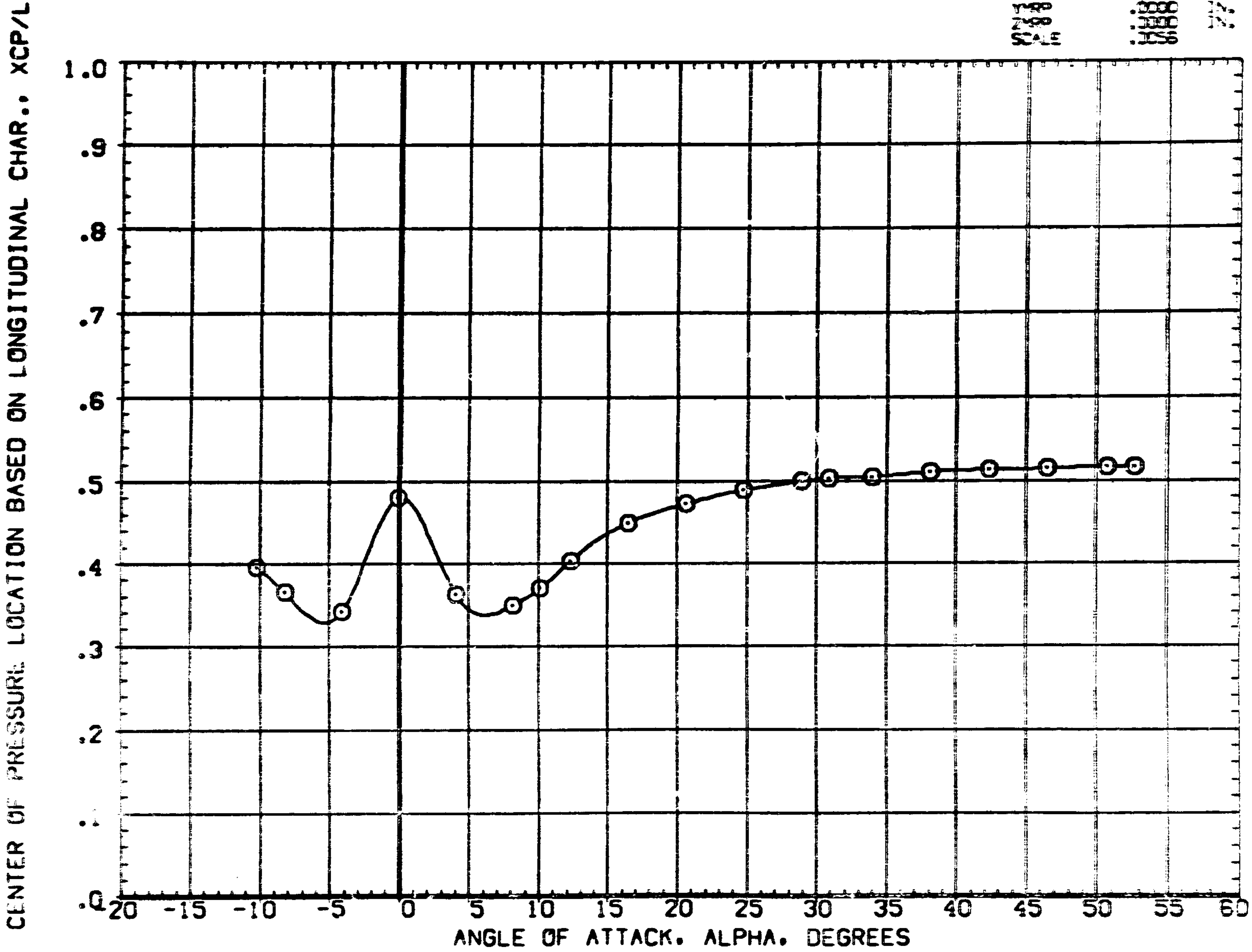


AERODYNAMIC CHARACTERISTICS OF A SOLID ROCKET BOOSTER

(A)MACH = 2.74

DATA SET SYMBOL CONFIGURATION DESCRIPTION
(A95106) ○ MSFC 590(SA26F) 142-IN. SRB(139) NBRE)

BETA	PHI	ELT	SEPRAT	REFERENCE INFORMATION		
.000	.000	.000	.000	SREF	.5030	SQ. IN
				LREF	.9000	IN.
				BREF	.9000	IN.
				XMRP	5.5570	IN.
				YMRP	.0000	IN.
				ZMRP	.0000	IN.
				SCALE	.0056	

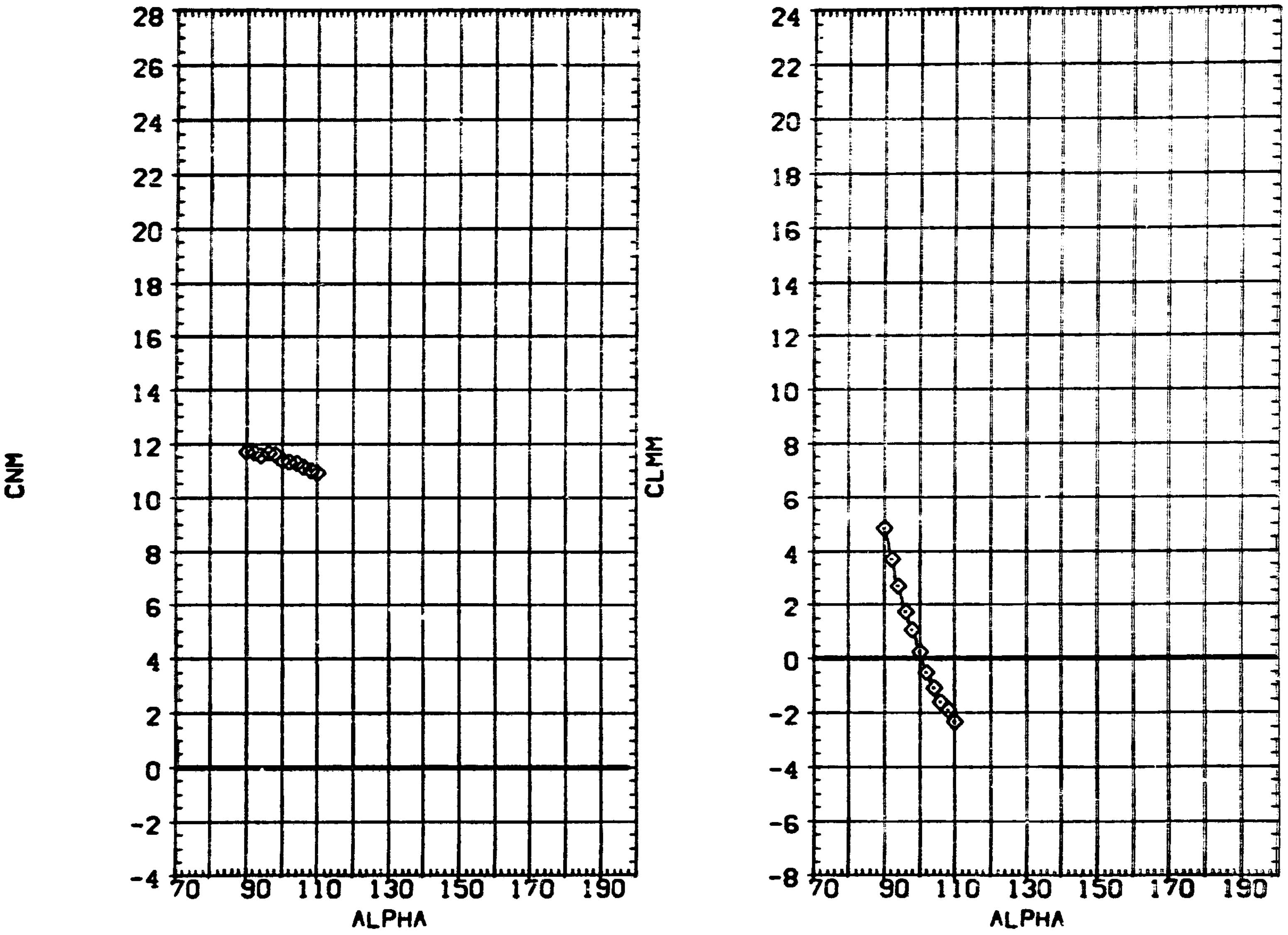


AERODYNAMIC CHARACTERISTICS OF A SOLID ROCKET BOOSTER

(A)MACH = 2.74

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRKT
[A95102]	○	DATA NOT AVAILABLE	.000	.000	.000	.000
[A95101]	□	DATA NOT AVAILABLE	.000	.000	.000	.000
[A95055]	◇	MSFC 595(SA26F) 142-IN. SRB(139) NBRE1B	.000	.000	.000	.000

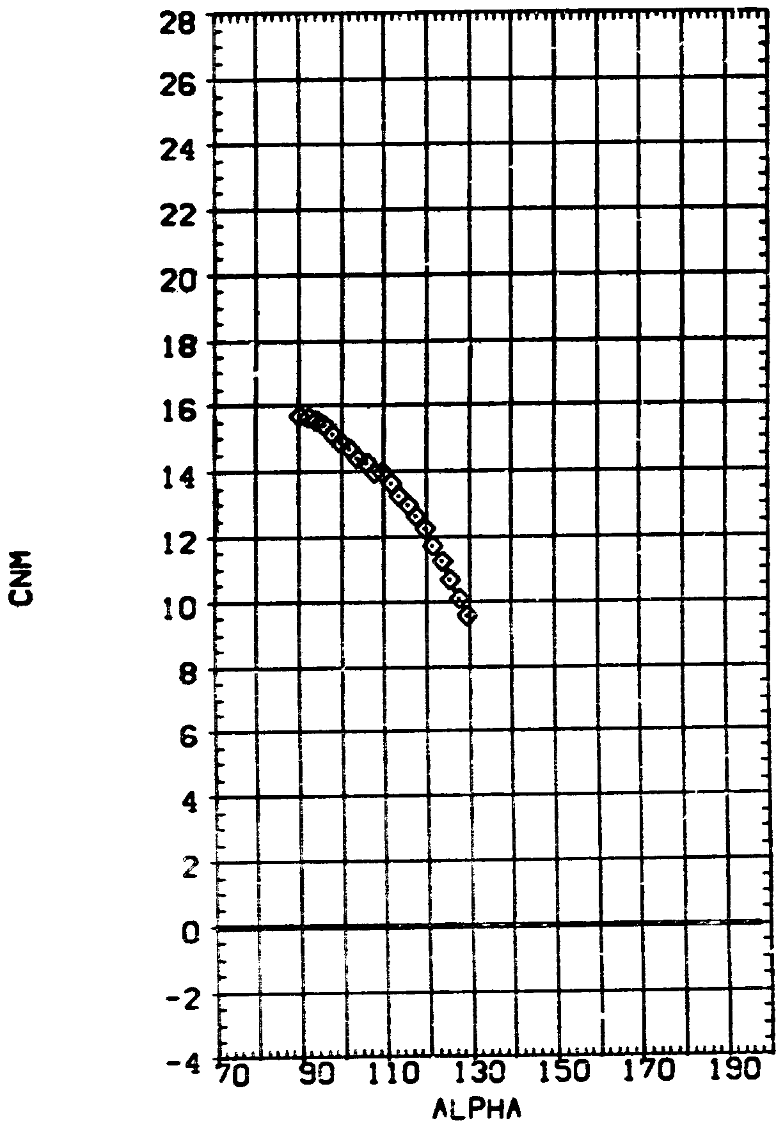
REFERENCE INFORMATION		
SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	

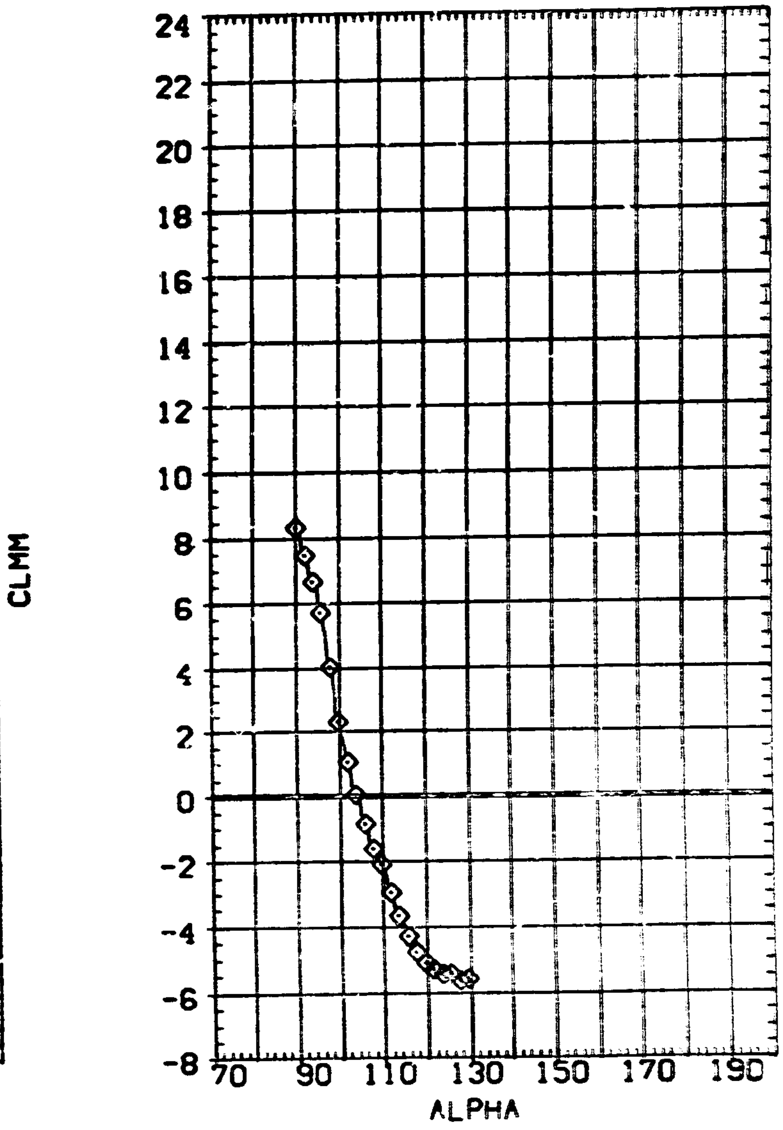


AERODYNAMIC CHARACTERISTICS OF A SRB WITH DIFFERENT NOZZLE / SKIRTS

(A)MACH = .60

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRKT	REFERENCE	INFORMATION	
(A95102)	○	DATA NOT AVAILABLE	.000	.000	.000	.000	SREF	.5030	SQ. IN
(A95101)	☐	DATA NOT AVAILABLE	.000	.000	.000	.000	LREF	.8000	IN.
(A95055)	◇	MSFC 595(SA26F) 142-IN. SRB(139) N8ME18	.000	.000	.000	.000	BREF	.8000	IN.
							XMRP	5.5570	IN.
							YMRP	.0000	IN.
							ZMRP	.0000	IN.
							SCALE	.0056	



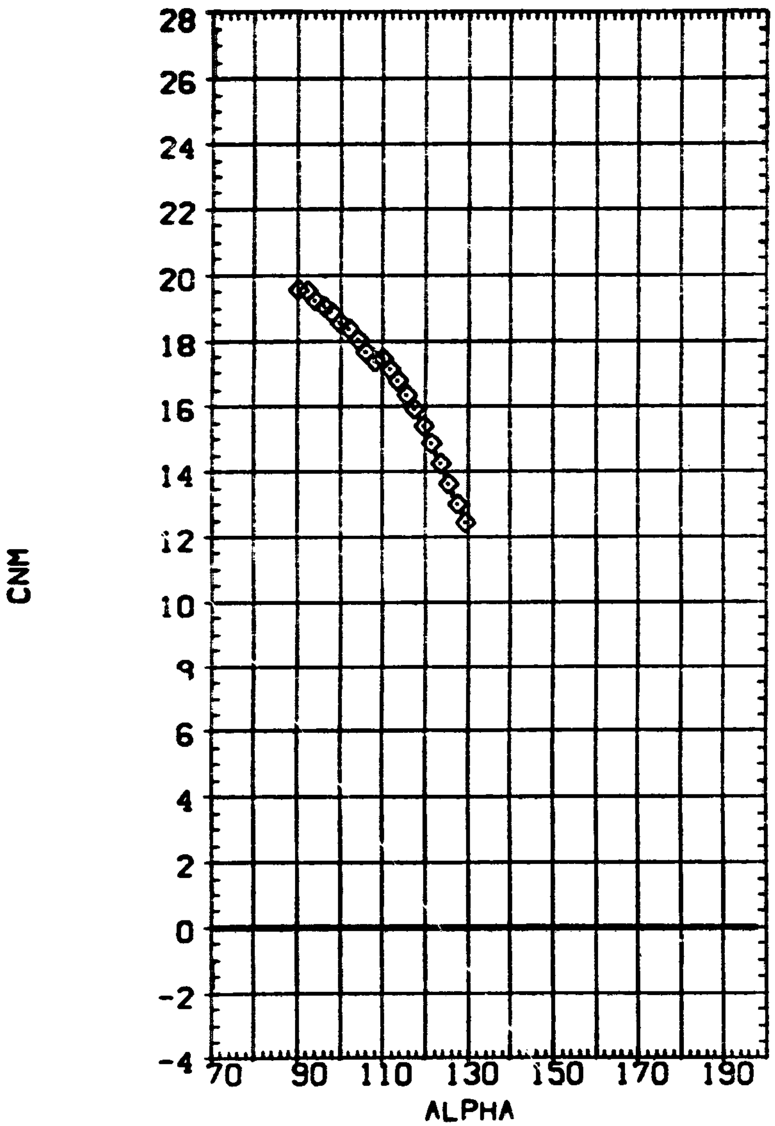


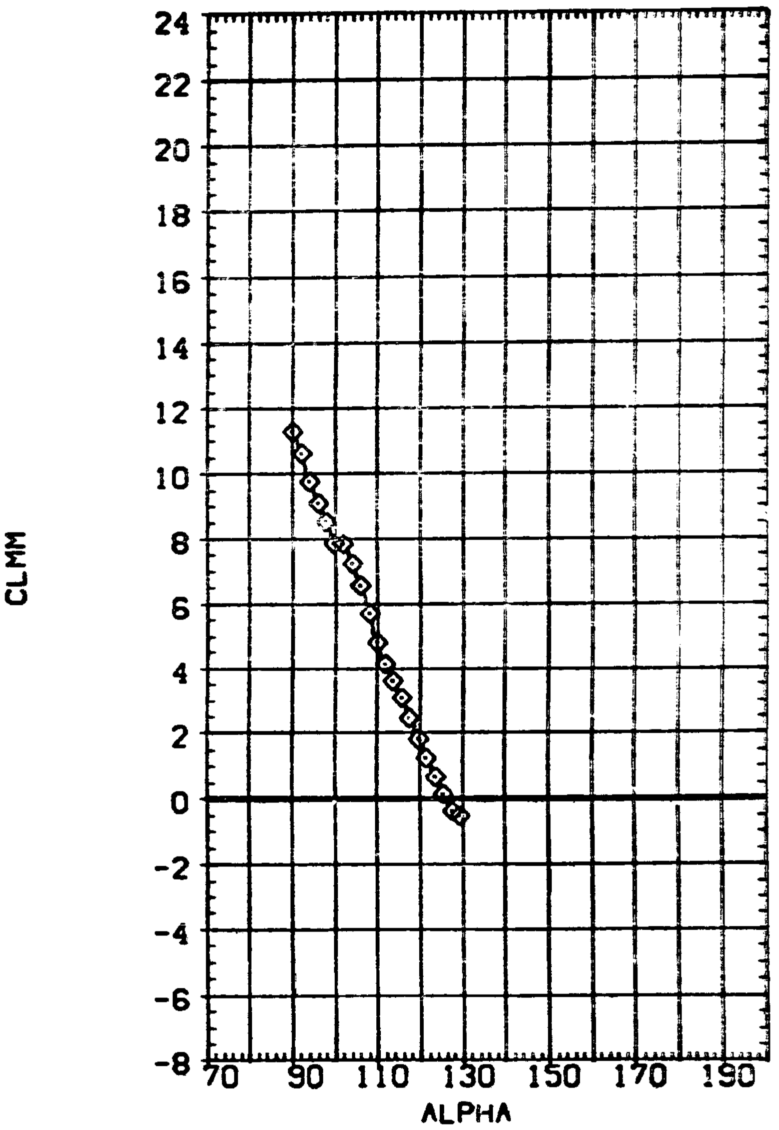
AERODYNAMIC CHARACTERISTICS OF A SRB WITH DIFFERENT NOZZLE / SKIRTS

(B)MACH = .90

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRKT
(AS5102)	○	DATA NOT AVAILABLE	.000	.000	.000	.000
(AS5101)	□	DATA NOT AVAILABLE	.000	.000	.000	.000
(AS5055)	◇	MSFC 595(SA26F) 142-IN. SRB(139) NBRE1B	.000	.000	.000	.000

REFERENCE INFORMATION		
SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	



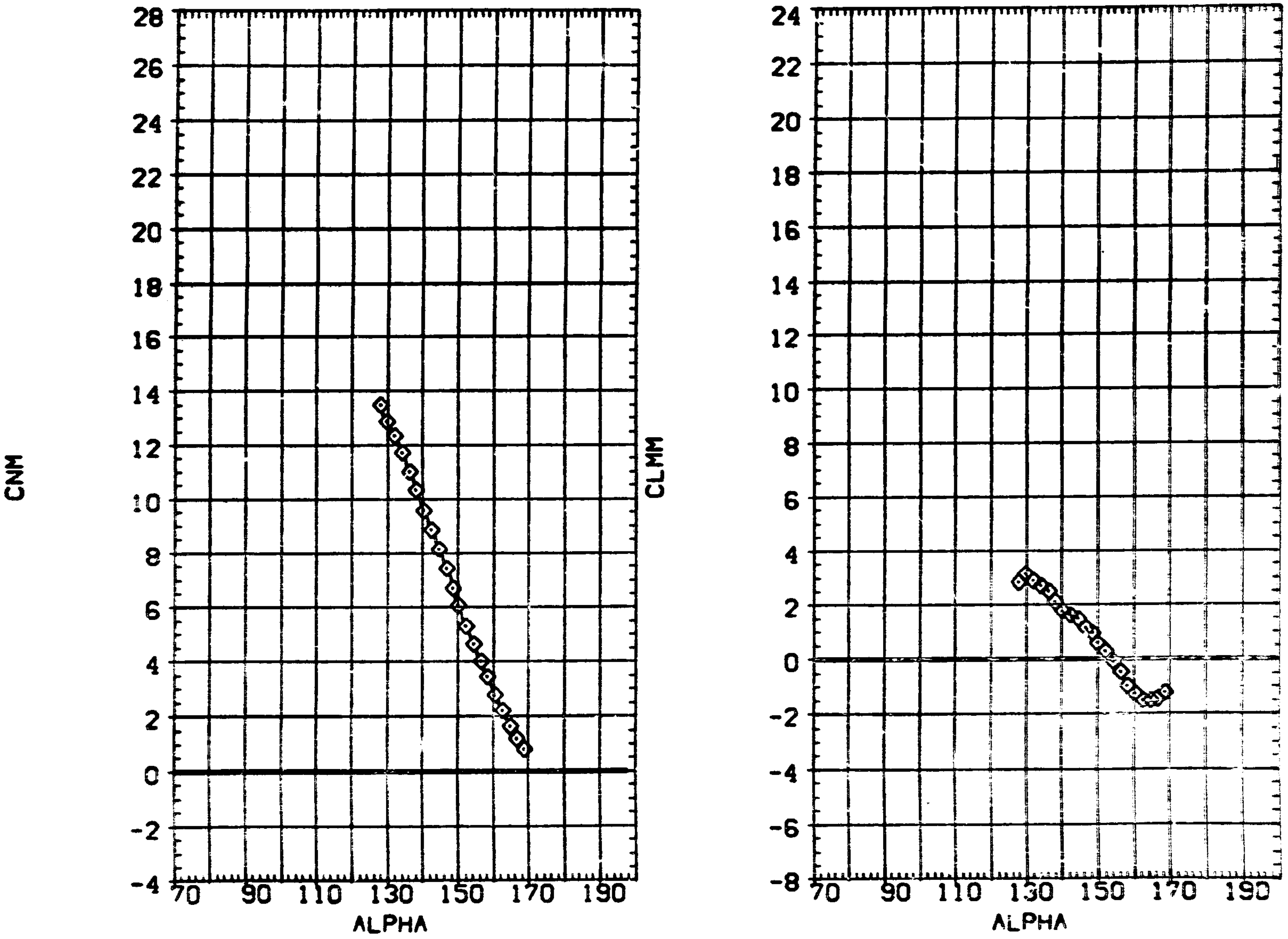


AERODYNAMIC CHARACTERISTICS OF A SRB WITH DIFFERENT NOZZLE / SKIRTS

(C)MACH = 1.20

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRKT
(A95102)	○	DATA NOT AVAILABLE	.000	.000	.000	.000
(A95101)	□	DATA NOT AVAILABLE	.000	.000	.000	.000
(A95055)	◇	MSFC 595(SA26F) 142-IN. SRB(139) NBRE18	.000	.000	.000	.000

REFERENCE	INFORMATION	
SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	



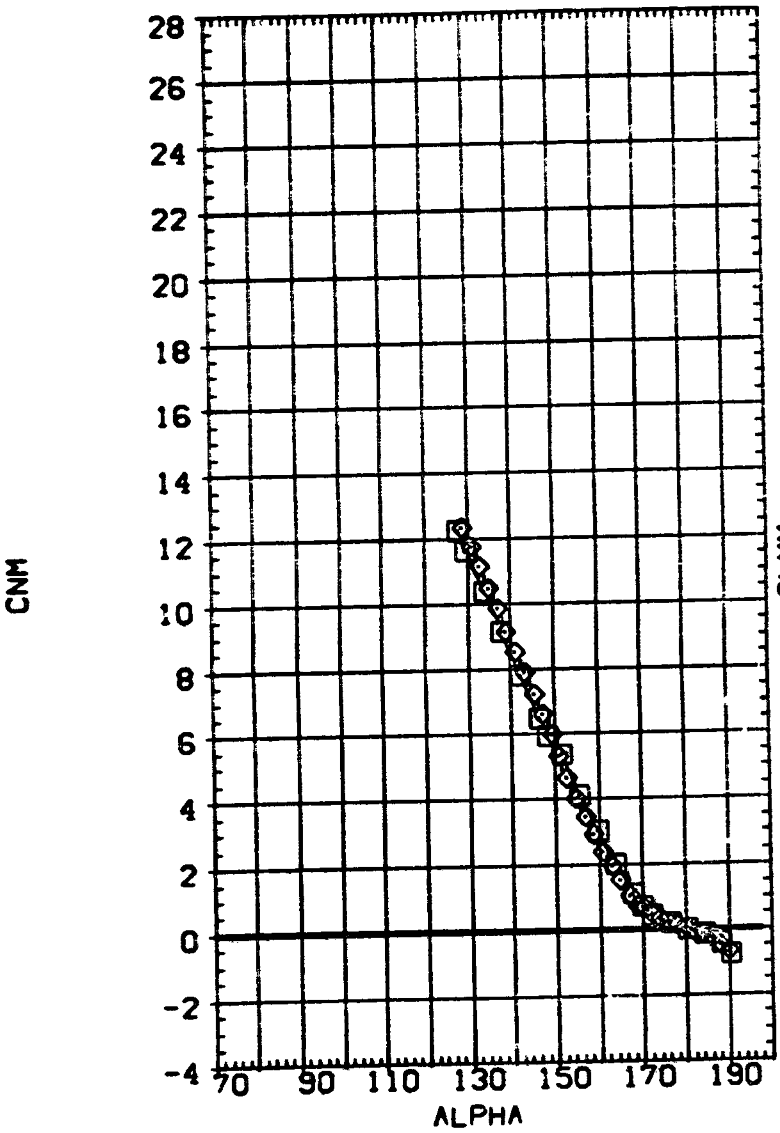
AERODYNAMIC CHARACTERISTICS OF A SRB WITH DIFFERENT NOZZLE / SKIRTS

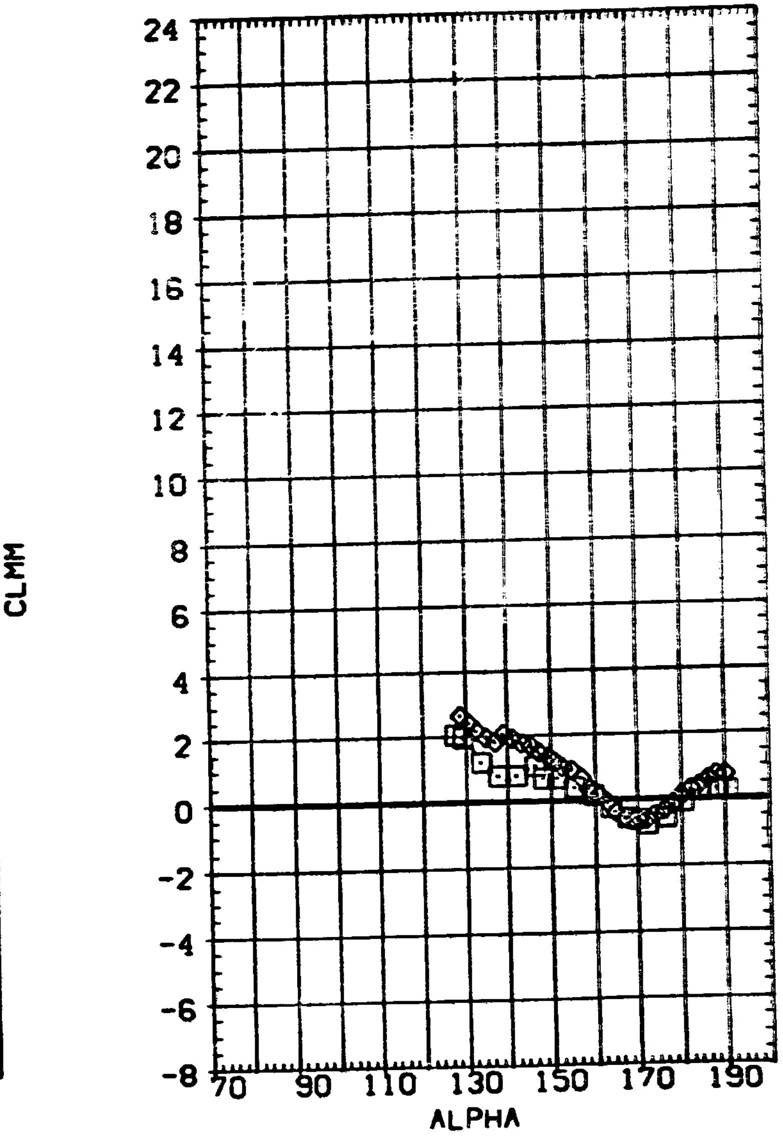
(D)MACH = 1.96

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRKT
[A95102]	○	DATA NOT AVAILABLE	.000	.000	.000	.000
[A95101]	□	MSFC 590(SA26F) 142-IN. SRB(139) NBRE1A	.000	.000	.000	.000
[A95055]	◇	MSFC 595(SA26F) 142-IN. SRB(139) NBRE1B	.000	.000	.000	.000

REFERENCE INFORMATION

SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	



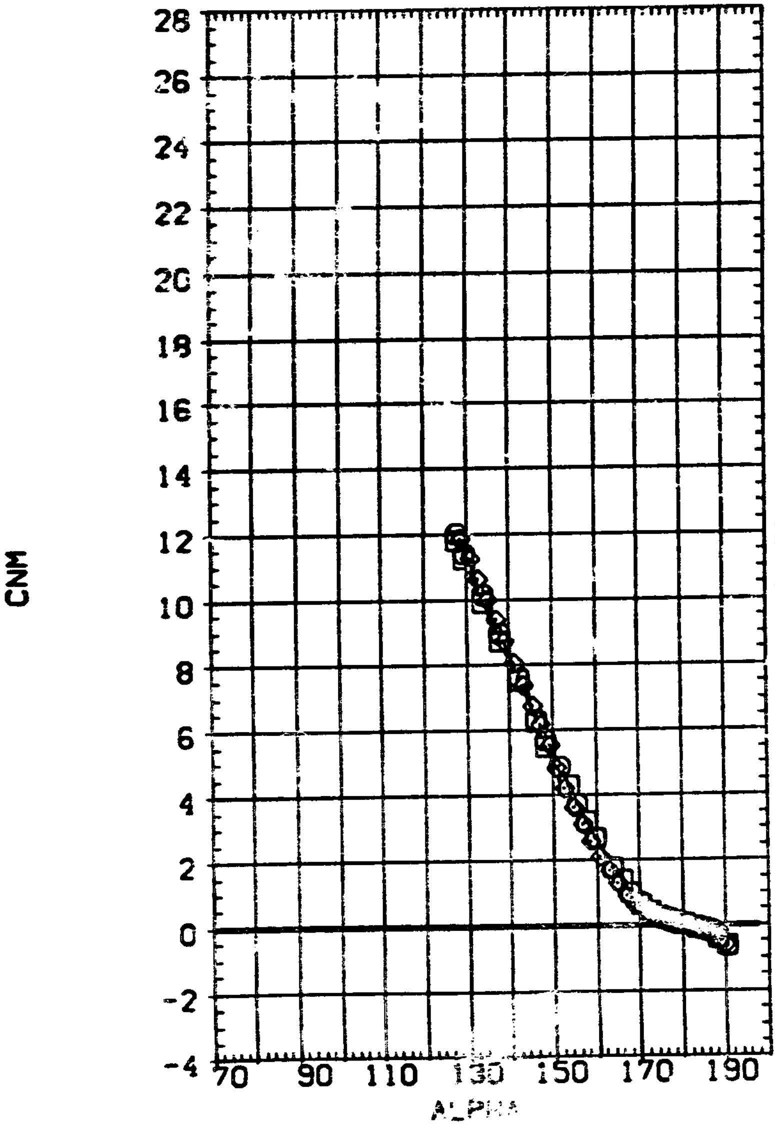


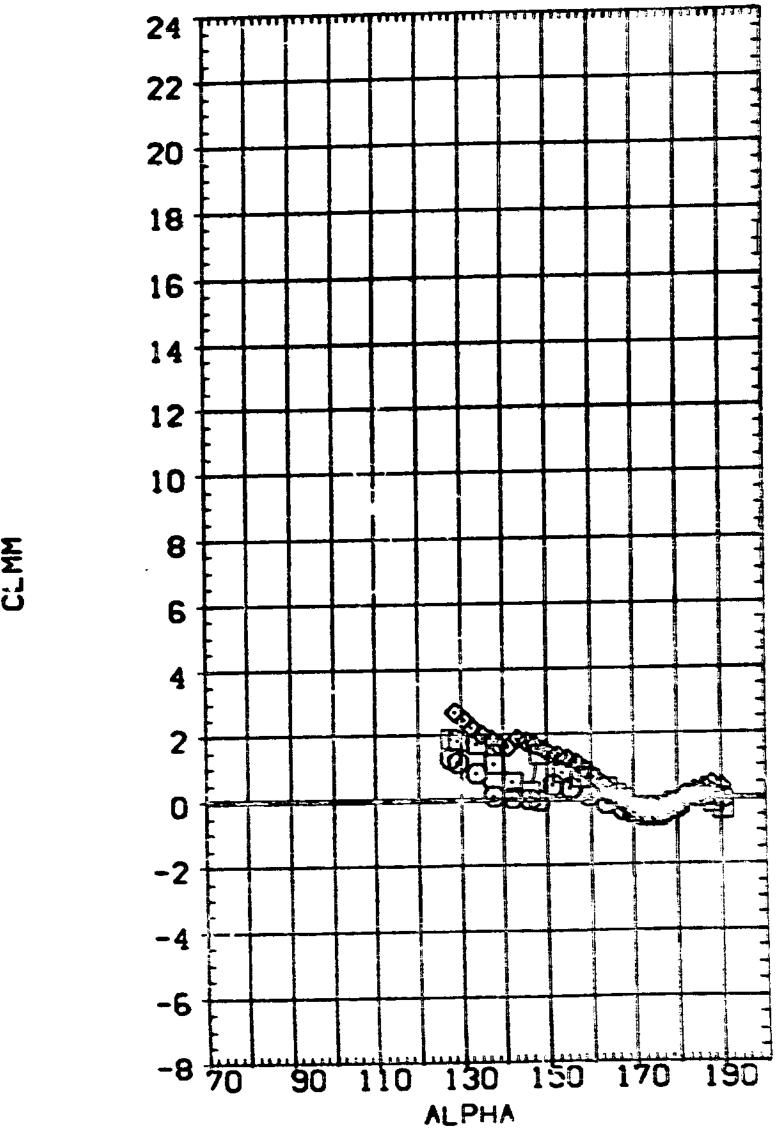
AERODYNAMIC CHARACTERISTICS OF A SRB WITH DIFFERENT NOZZLE / SKIRTS

(E)MACH = 2.74

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRKT
(A95102)	○	MSFC 590(SA26F) 142-IN. SRB(139) NBRE1	.000	.000	.000	.000
(A95101)	□	MSFC 590(SA26F) 142-IN. SRB(139) NBRE1A	.000	.000	.000	.000
(A95055)	◇	MSFC 595(SA26F) 142-IN. SRB(139) NBRE1B	.000	.000	.000	.000

REFERENCE	INFORMATION	
SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	



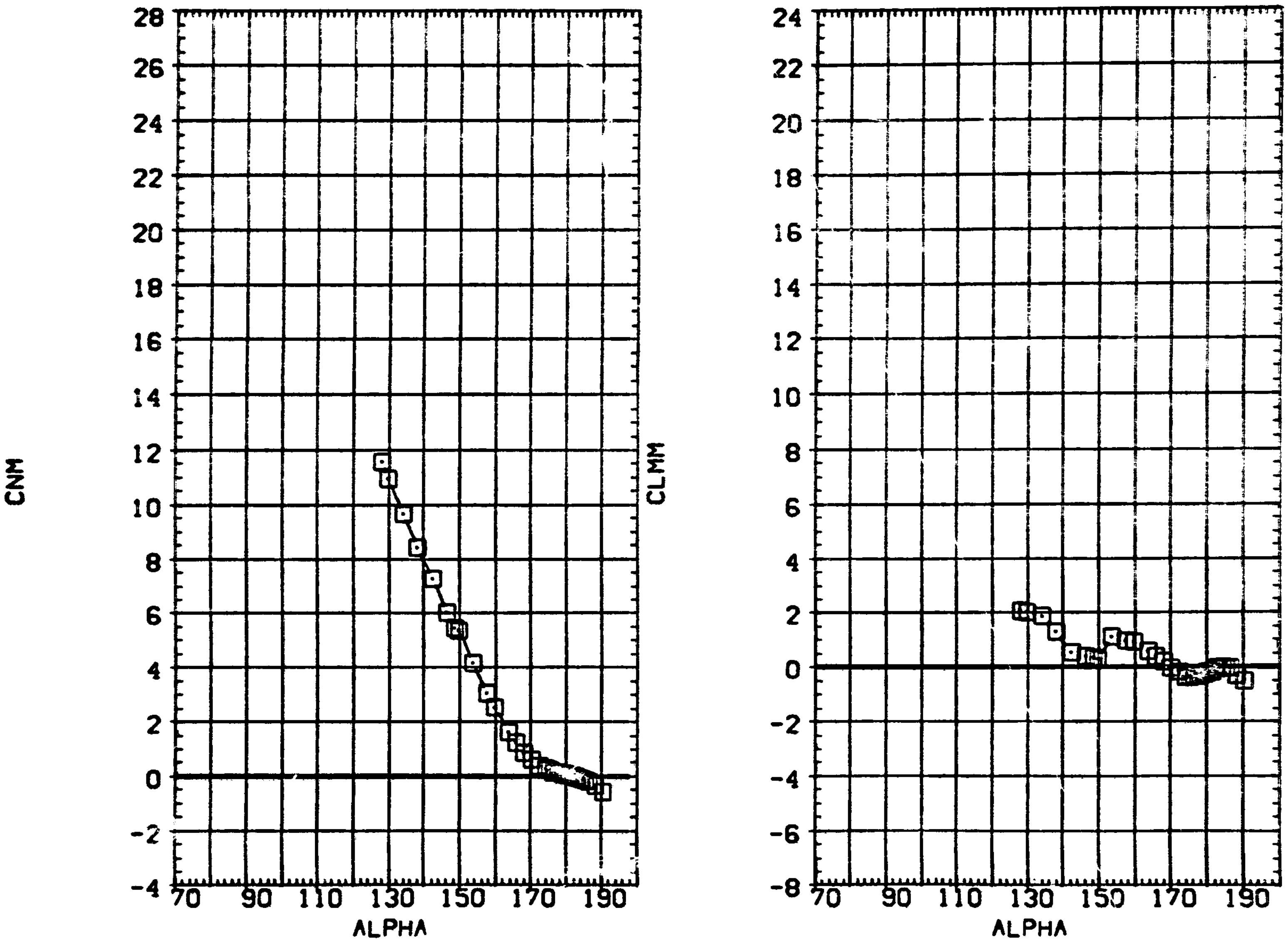


AERODYNAMIC CHARACTERISTICS OF A SRB WITH DIFFERENT NOZZLE / SKIRTS

(F)MACH = 3.48

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRKT
(A95102)	○	DATA NOT AVAILABLE	.000	.000	.000	.000
(A95101)	□	MSFC 590(SA26F) 142-IN. SRB(139) NBREIA	.000	.000	.000	.000
(A95055)	◇	DATA NOT AVAILABLE	.000	.000	.000	.000

REFERENCE	INFORMATION	
SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	



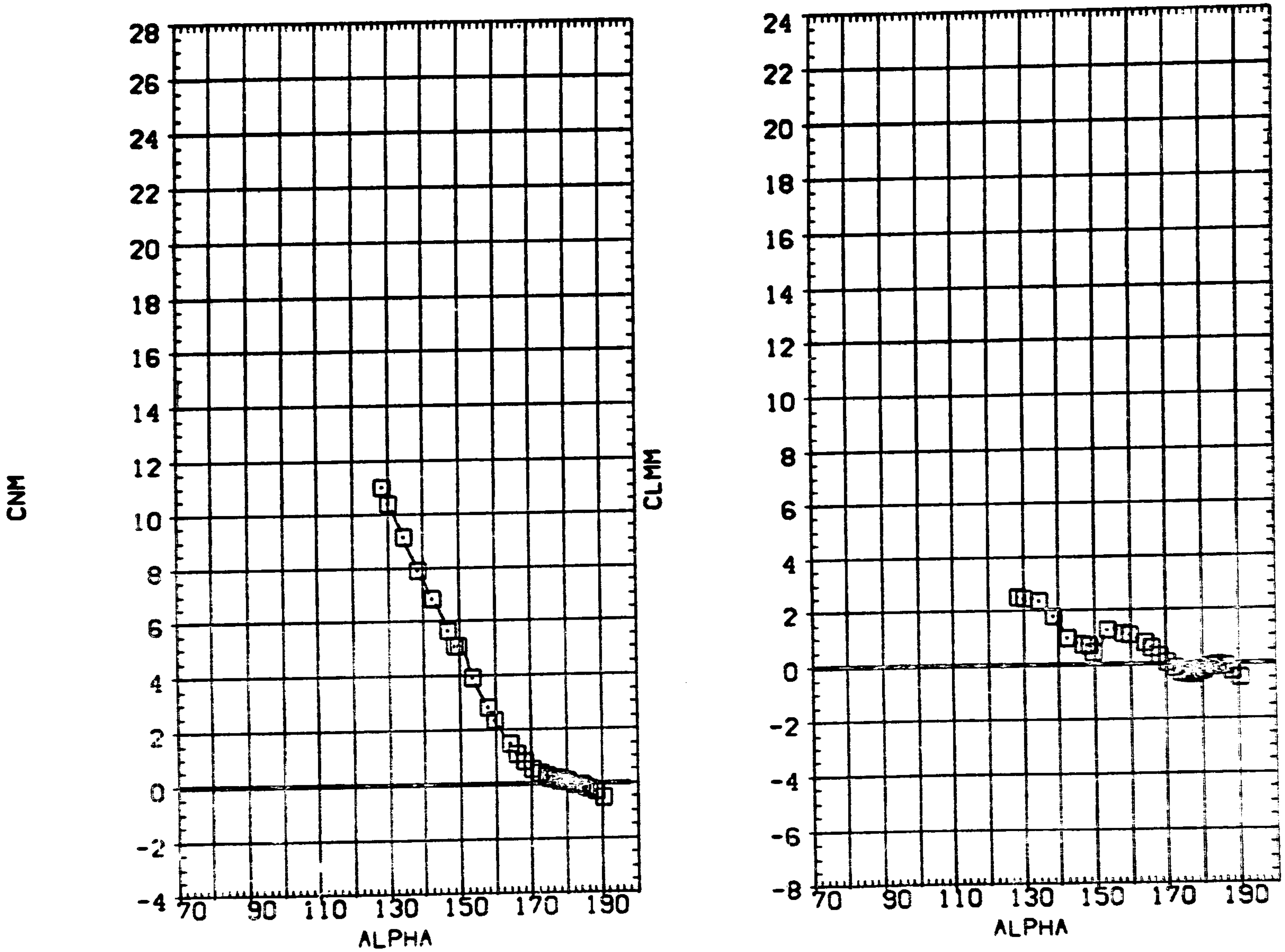
AERODYNAMIC CHARACTERISTICS OF A SRB WITH DIFFERENT NOZZLE / SKIRTS

(G)MACH = 4.00

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
[A95102]	○	DATA NOT AVAILABLE
[A95101]	☐	MSFC 590(SA26F) 142-IN. SRB(139) NBRE1A
[A95055]	◇	DATA NOT AVAILABLE

BETA	PHI	ELT	SEPRKT
.000	.000	.000	.000
.000	.000	.000	.000
.000	.000	.000	.000

REFERENCE	INFORMATION	
SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	



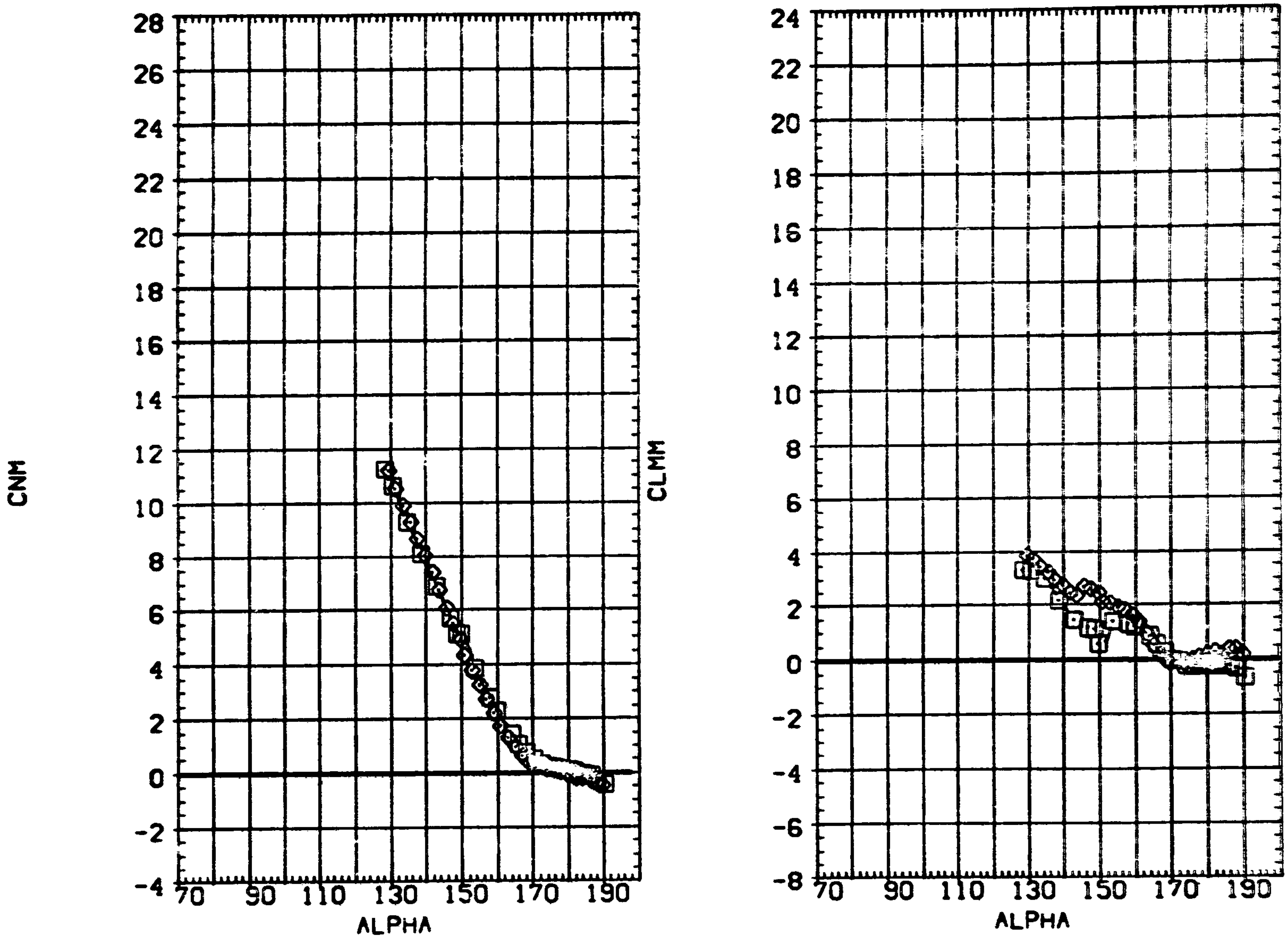
AERODYNAMIC CHARACTERISTICS OF A SRB WITH DIFFERENT NOZZLE / SKIRTS

(H)MACH = 4.45

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(A95102)	○	DATA NOT AVAILABLE
(A95101)	□	MSFC 590(SA26F) 142-IN. SRB(139) NBRE1A
(A95055)	◇	MSFC 595(SA26F) 142-IN. SRB(139) NBRE1B

BETA	PHI	ELT	SEPRKT
.000	.000	.000	.000
.000	.000	.000	.000
.000	.000	.000	.000

REFERENCE	INFORMATION	
SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	



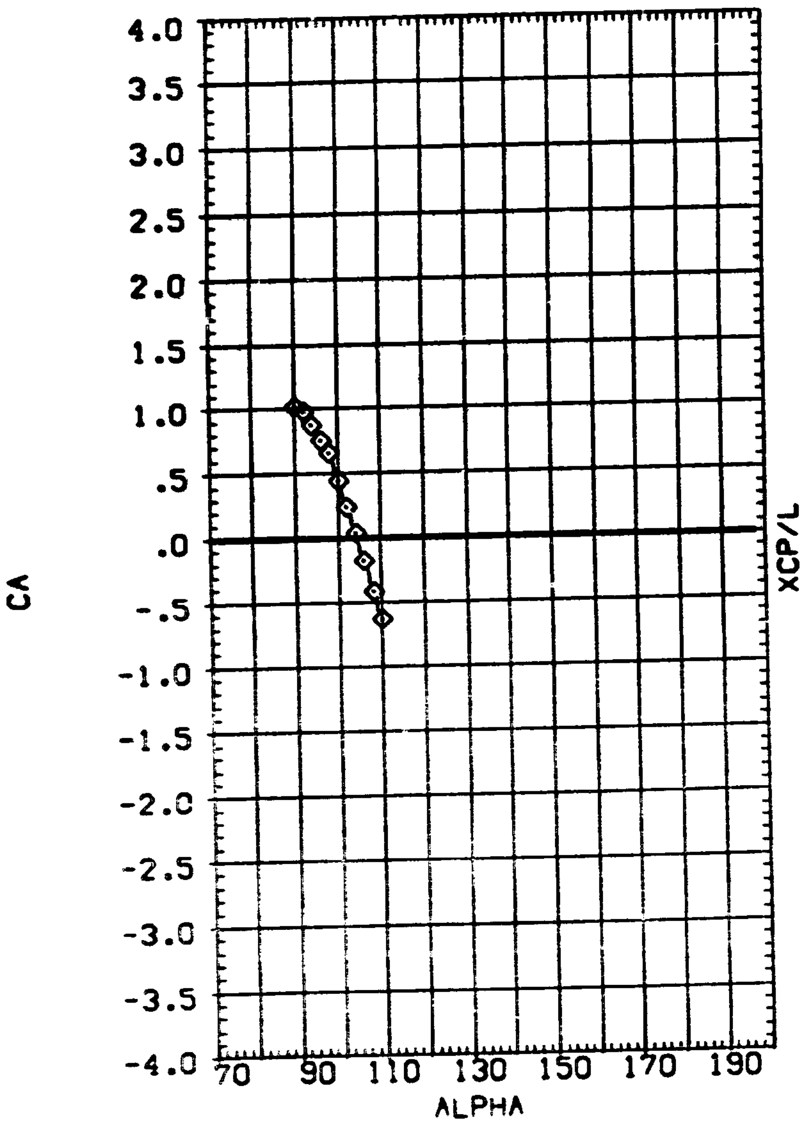
AERODYNAMIC CHARACTERISTICS OF A SRB WITH DIFFERENT NOZZLE / SKIRTS

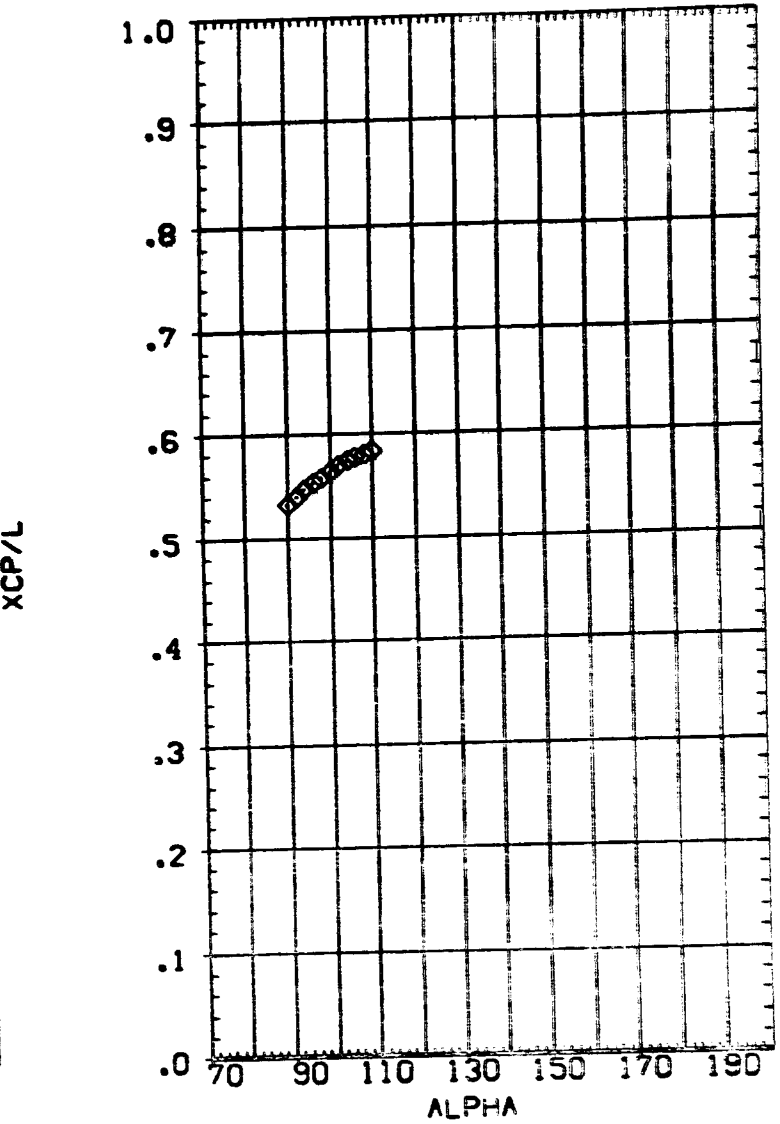
(I)MACH = 4.96

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(A95102)	□	DATA NOT AVAILABLE
(A95101)	△	DATA NOT AVAILABLE
(A95055)	◇	MSFC 595(SA26F) 142-IN. SRB(139) NBRE18

BETA	PHI	ELT	SEPRKT
.000	.000	.000	.000
.000	.000	.000	.000
.000	.000	.000	.000

REFERENCE	INFORMATION	
SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	





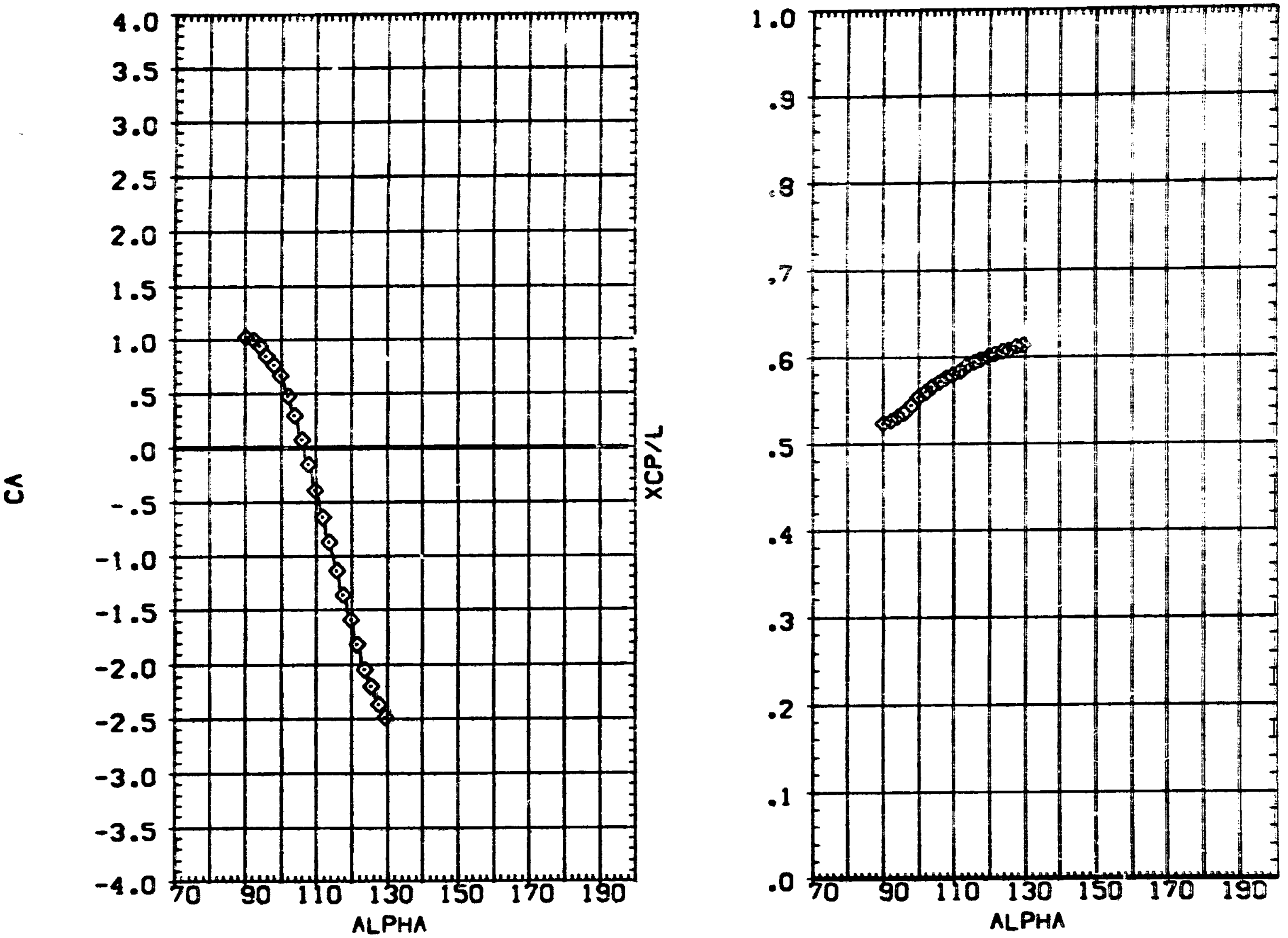
AERODYNAMIC CHARACTERISTICS OF A SRB WITH DIFFERENT NOZZLE / SKIRTS

(A)MACH = .60

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(A95102)	○	DATA NOT AVAILABLE
(A95101)	□	DATA NOT AVAILABLE
(A95055)	◇	MSFC 595(SA26F) 142-IN. SRB(139) NBRE1B

BETA	PHI	ELT	SEPRKT
.000	.000	.000	.000
.000	.000	.000	.000
.000	.000	.000	.000

REFERENCE	INFORMATION	
SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	

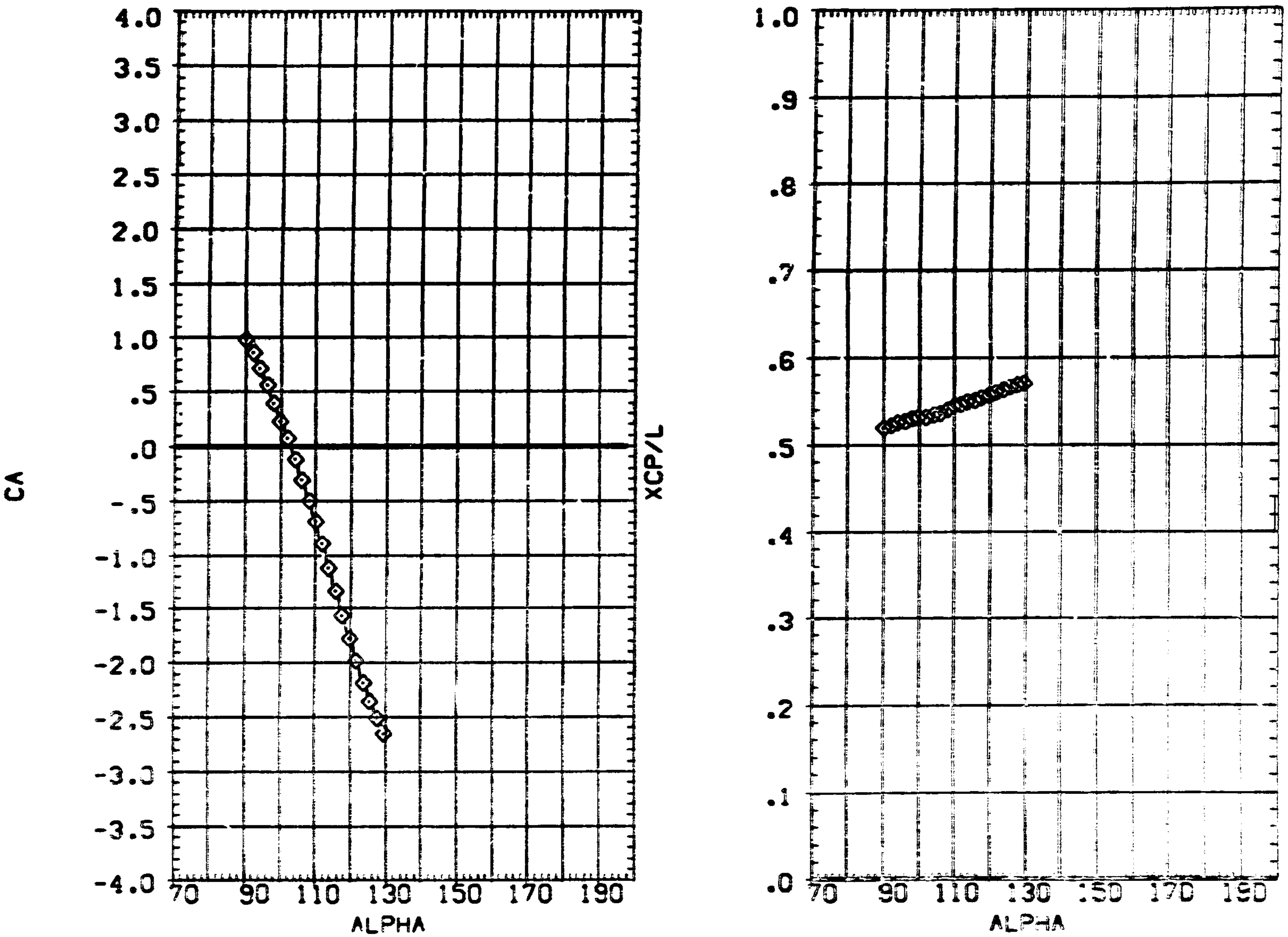


AERODYNAMIC CHARACTERISTICS OF A SRB WITH DIFFERENT NOZZLE / SKIRTS

(B)MACH = .90

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRKT
[A95102]	○	DATA NOT AVAILABLE	.000	.000	.000	.000
[A95101]	□	DATA NOT AVAILABLE	.000	.000	.000	.000
[A95055]	◇	MSFC 595(SA26F) 142-IN. SRB(139) NBRE1B	.000	.000	.000	.000

REFERENCE INFORMATION		
SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0030	IN.
ZMRP	.0000	IN.
SCALE	.0056	



AERODYNAMIC CHARACTERISTICS OF A SRB WITH DIFFERENT NOZZLE / SKIRTS

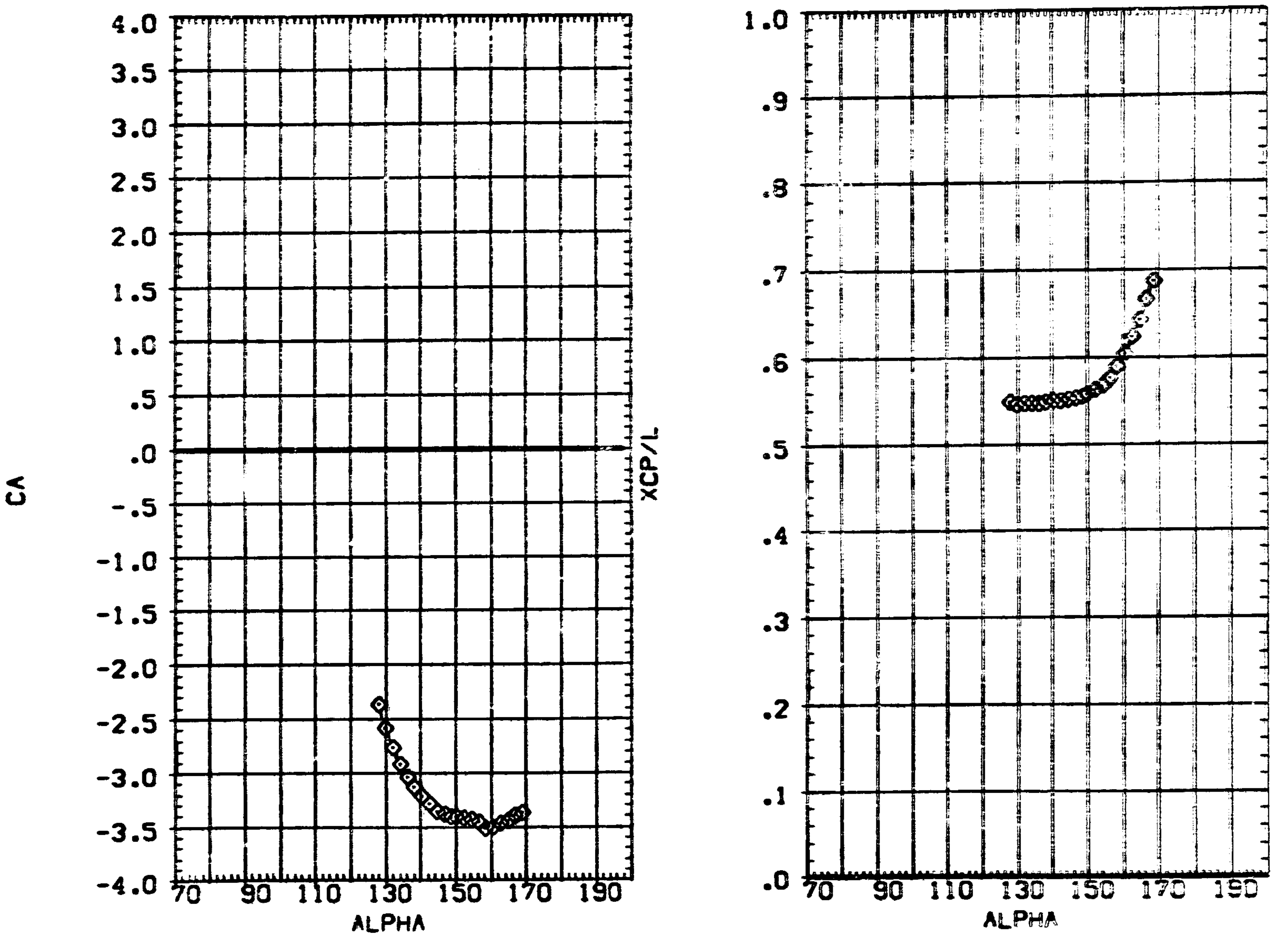
(C)MACH = 1.20

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(A95102)	○	DATA NOT AVAILABLE
(A95101)	□	DATA NOT AVAILABLE
(A95055)	◇	MSFC 595(SA26F) 142-IN. SRB(139) NBRE18

BETA	PHI	ELT	SEPRAT
.000	.000	.000	.000
.000	.000	.000	.000
.000	.000	.000	.000

REFERENCE INFORMATION

SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	



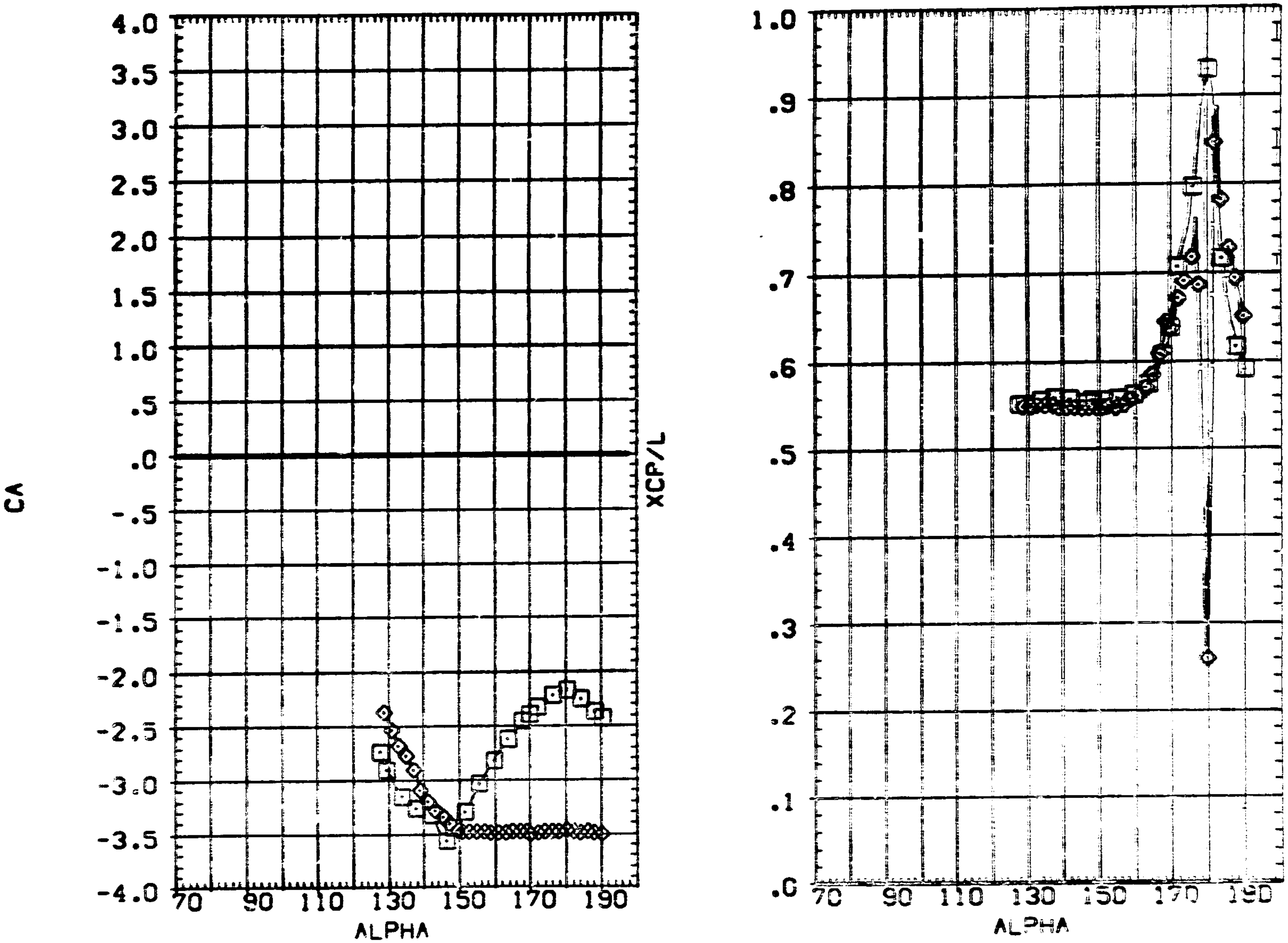
AERODYNAMIC CHARACTERISTICS OF A SRB WITH DIFFERENT NOZZLE / SKIRTS

(D)MACH = 1.96

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRAT
(A95102)	○	DATA NOT AVAILABLE	.000	.000	.000	.000
(A95101)	□	MSFC 590(SA26F) 142-IN. SRB(139) NBRE1A	.000	.000	.000	.000
(A95055)	◇	MSFC 595(SA26F) 142-IN. SRB(139) NBRE1B	.000	.000	.000	.000

REFERENCE INFORMATION

SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.6000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	

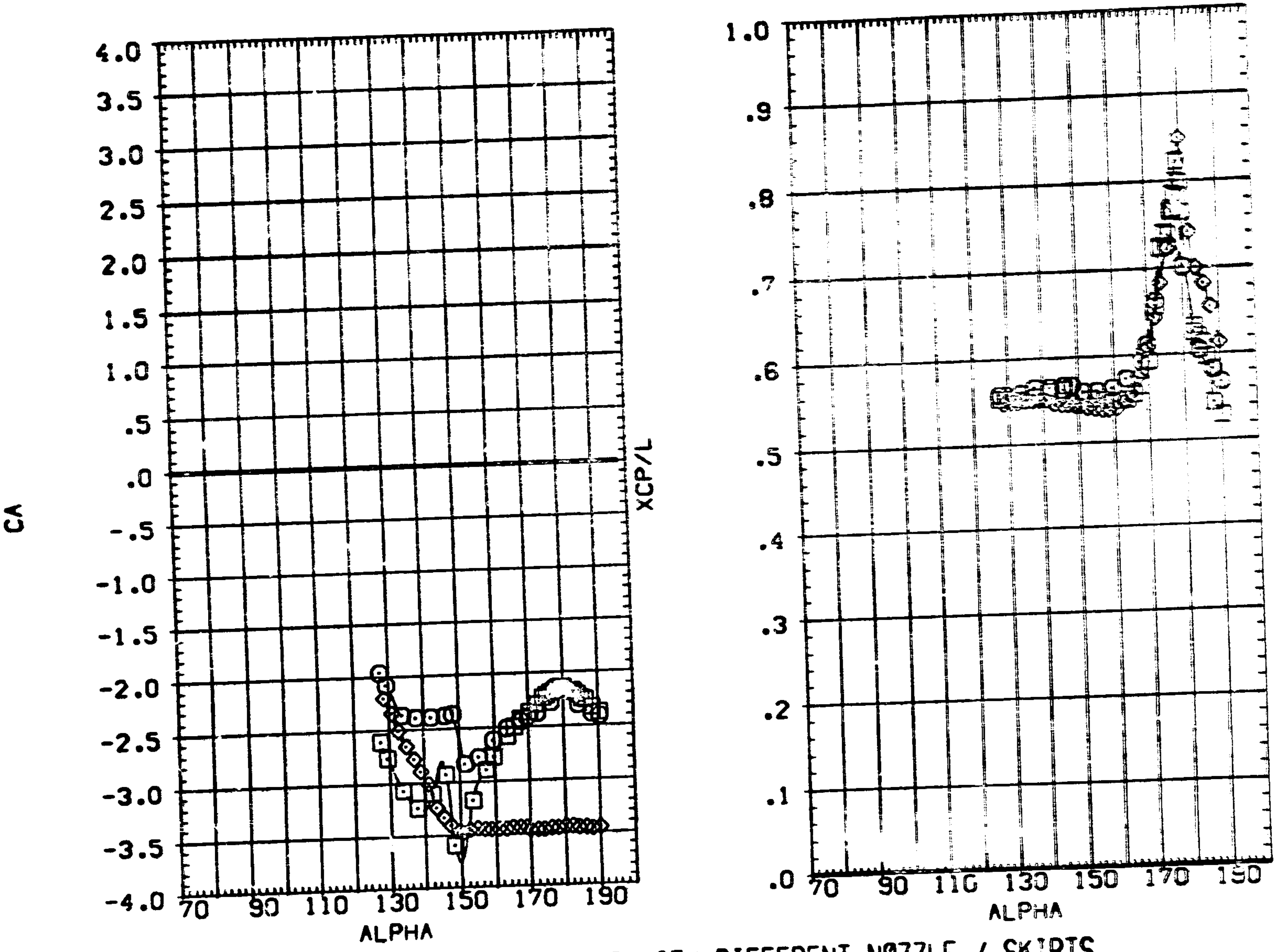


AERODYNAMIC CHARACTERISTICS OF A SRB WITH DIFFERENT NOZZLE / SKIRTS

(E)MAC- = 2.74

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRKT
(A95102)	○	MSFC 590(SA26F) 142-IN. SRB(139) NBRE1	.000	.000	.000	.000
(A95101)	□	MSFC 590(SA26F) 142-IN. SRB(139) NBRE1A	.000	.000	.000	.000
(A95055)	◇	MSFC 595(SA26F) 142-IN. SRB(139) NBRE1B	.000	.000	.000	.000

REFERENCE INFORMATION		
SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.9000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	

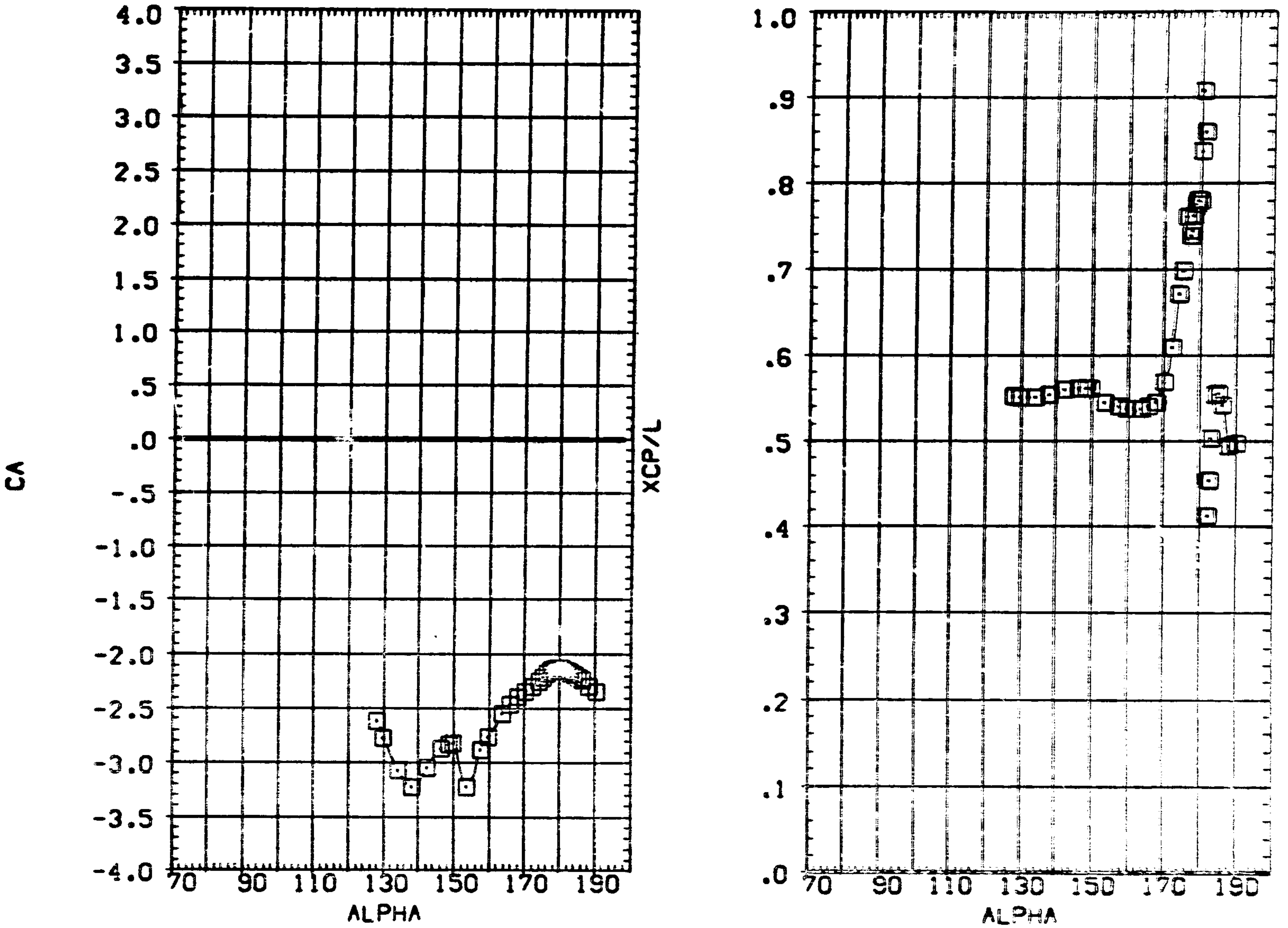


AERODYNAMIC CHARACTERISTICS OF A SRB WITH DIFFERENT NOZZLE / SKIRTS

(F)MACH = 3.48

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRKT
(A95102)	○	DATA NOT AVAILABLE	.000	.000	.000	.000
(A95101)	□	MSFC 590(SA26F) 142-IN. SRB(139) NBRE1A	.000	.000	.000	.000
(A95055)	◇	DATA NOT AVAILABLE	.000	.000	.000	.000

REFERENCE	INFORMATION	
SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	



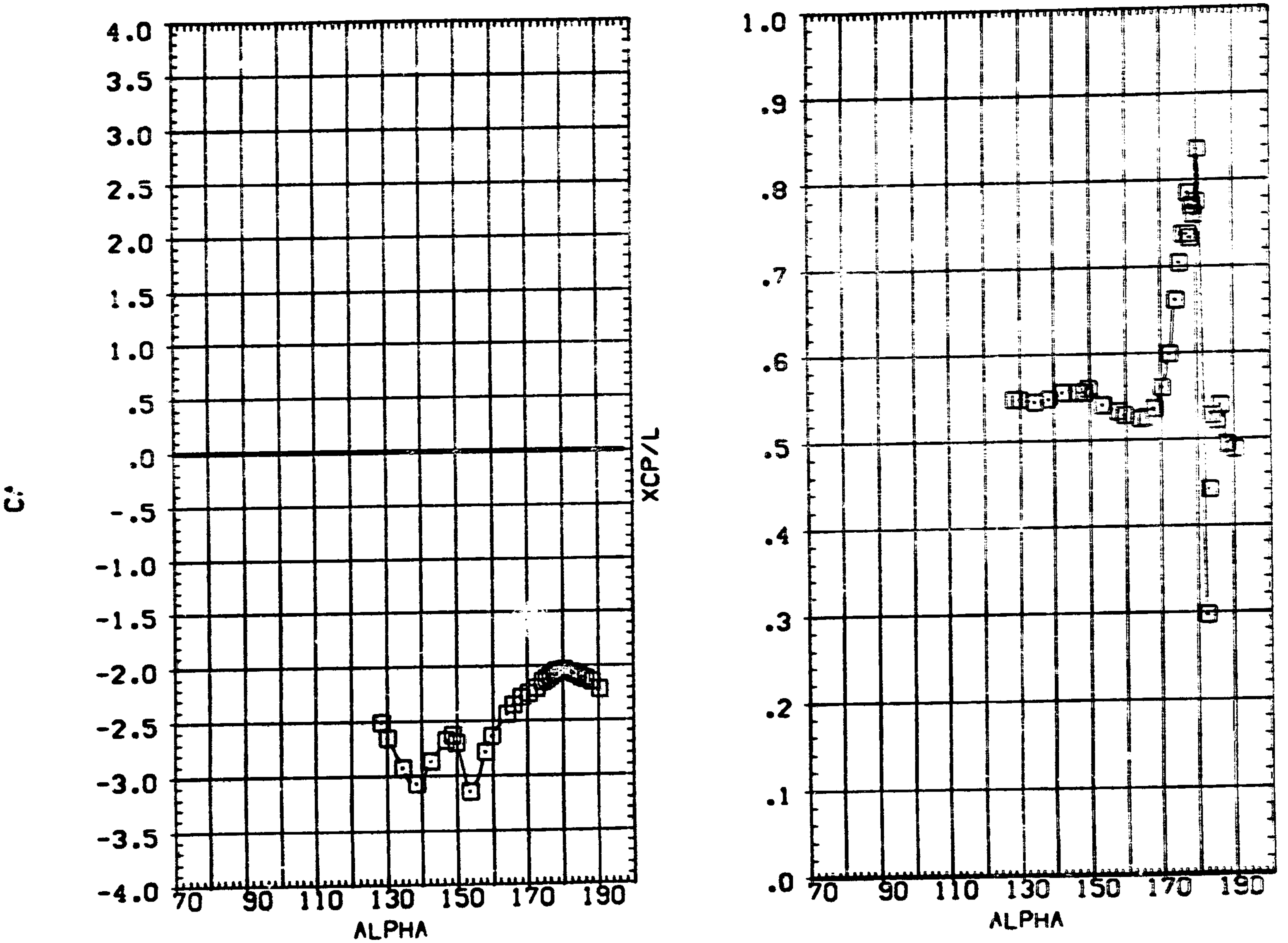
AERODYNAMIC CHARACTERISTICS OF A SRB WITH DIFFERENT NOZZLE / SKIRTS

(G)MACH = 4.00

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(A95102)	○	DATA NOT AVAILABLE
(A95101)	□	MSFC 590(SA26F) 142-IN. SRB(139) NBREIA
(A95055)	◇	DATA NOT AVAILABLE

BETA	PHI	ELT	SEPRKT
.000	.000	.000	.000
.000	.000	.000	.000
.000	.000	.000	.000

REFERENCE	INFORMATION	
SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	

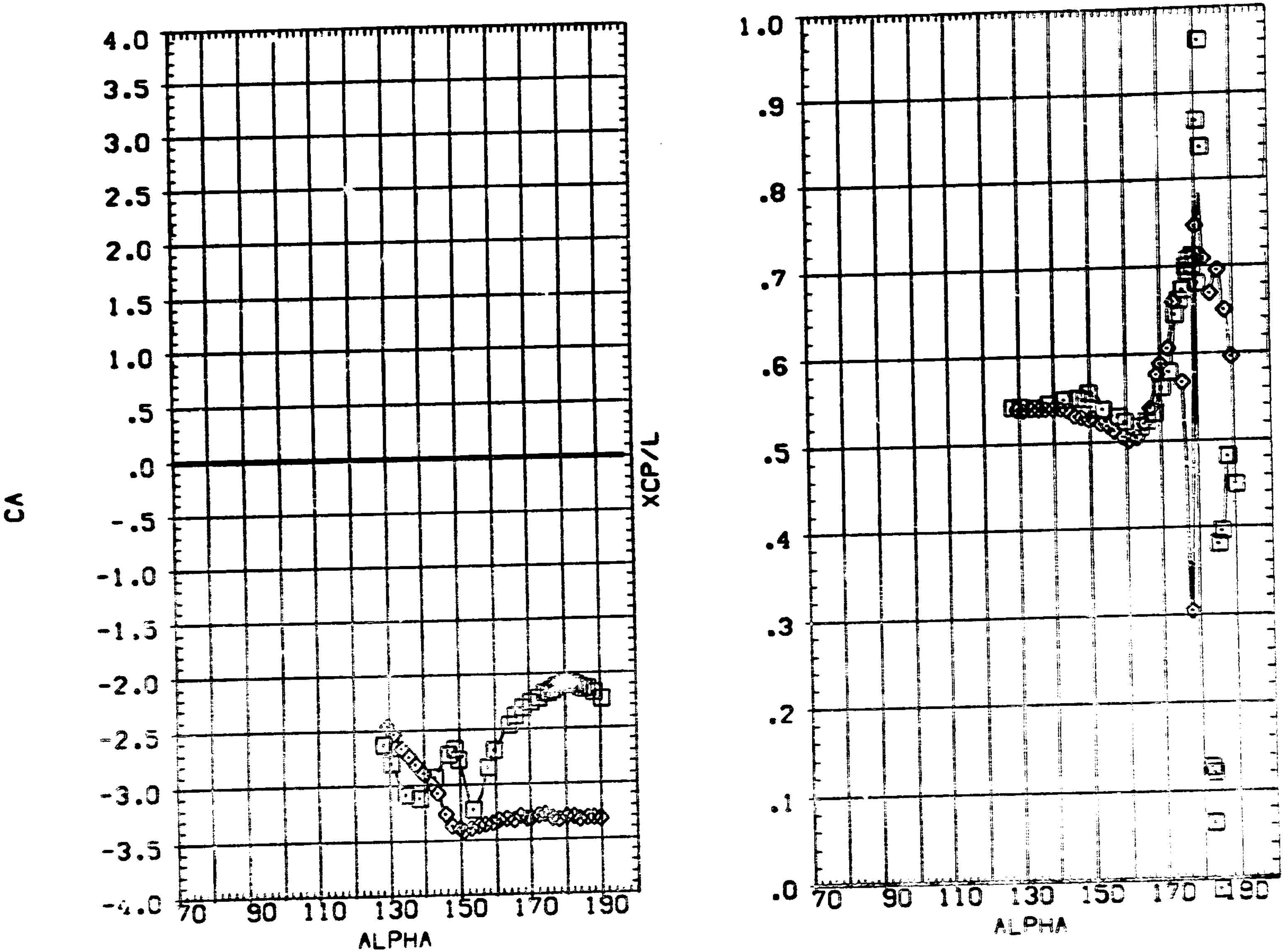


AERODYNAMIC CHARACTERISTICS OF A SRB WITH DIFFERENT NOZZLE / SKIRTS

(H)MACH = 4.45

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRMT
(A95102)	○	DATA NOT AVAILABLE	.000	.000	.000	.000
(A95101)	□	MSFC 590(SA26F) 142-IN. SRB(139) NBRE1A	.000	.000	.000	.000
(A95055)	◇	MSFC 595(SA26F) 142-IN. SRB(139) NBRE1B	.000	.000	.000	.000

REFERENCE INFORMATION		
SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	

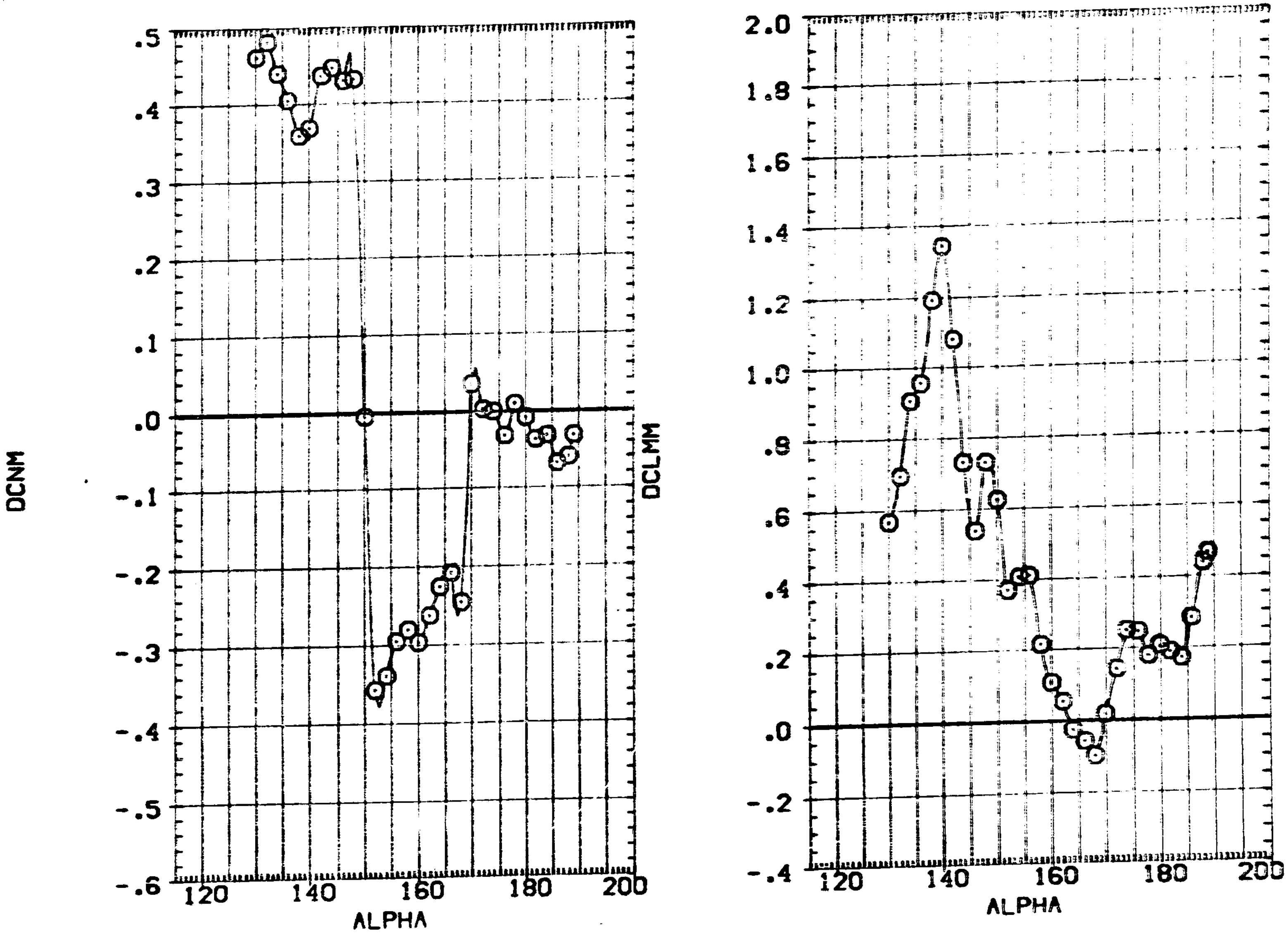


AERODYNAMIC CHARACTERISTICS OF A SRB WITH DIFFERENT NOZZLE / SKIRTS

(I)MACH = 4.96

DATA SET SYMBOL CONFIGURATION DESCRIPTION
(D95055) ○ MSFC 590/595 (SA26F) EFFECT OF EIB - EIA

BETA	PHI	ELT	SEPRKT	REFERENCE INFORMATION		
.000	.000	.000	.000	SREF	.5030	SQ. IN
				LREF	.8000	IN.
				BREF	.8000	IN.
				XMRP	5.5570	IN.
				YMRP	.0000	IN.
				ZMRP	.0000	IN.
				SCALE	.0056	



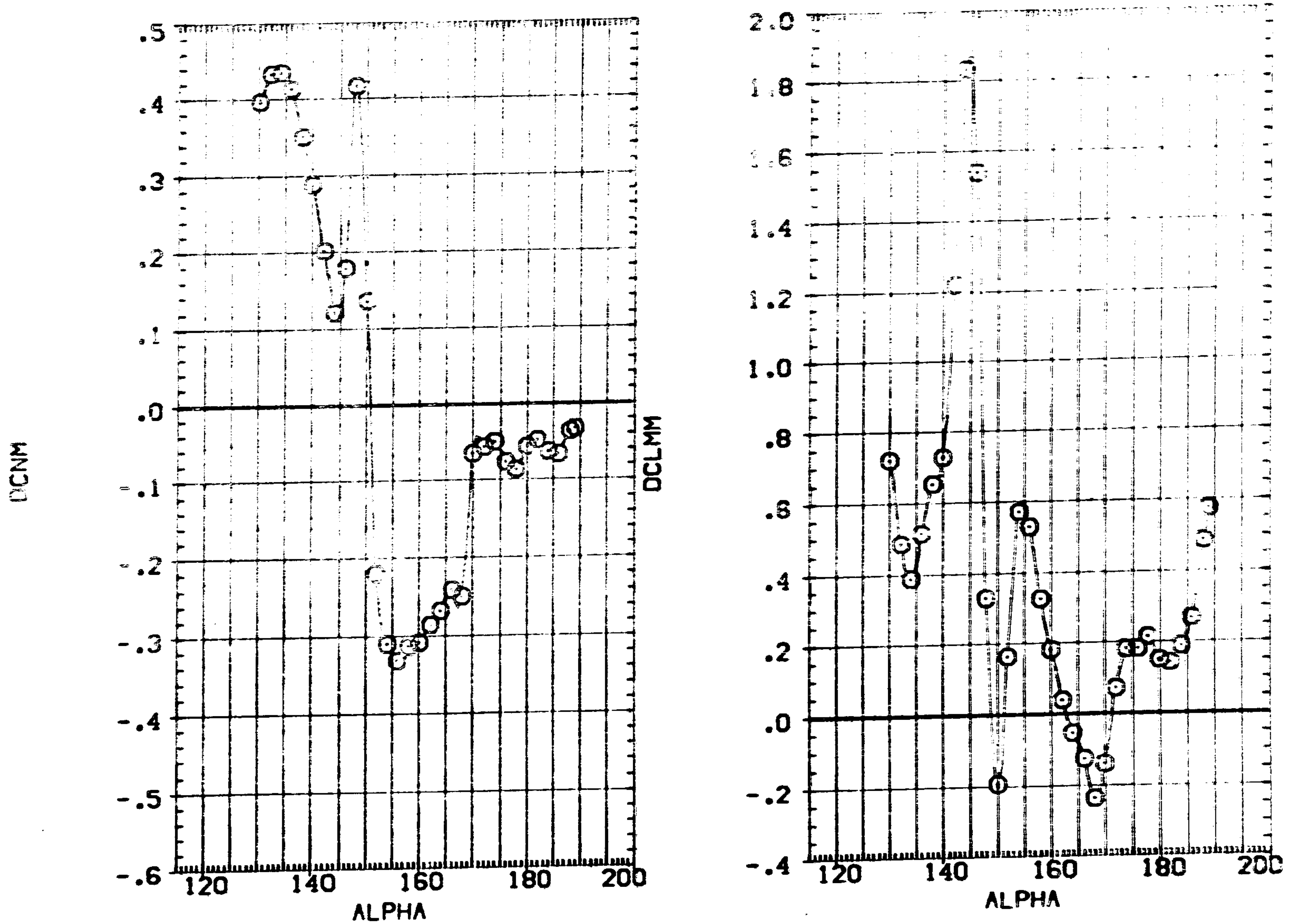
EFFECT OF TRUNCATED NOZZLE ON SRB AERODYNAMIC CHARACTERISTICS
(A)MACH = 2.74

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(D95135)	○	MSFC 590/595 (SA26F) EFFECT OF E1B - E1A

BETA	PHI	ELT	SEPRKT
.000	.000	.000	.000

REFERENCE INFORMATION

SREF	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
SCALE	[illegible]



EFFECT OF TRUNCATED NOZZLE ON SRB AERODYNAMIC CHARACTERISTICS

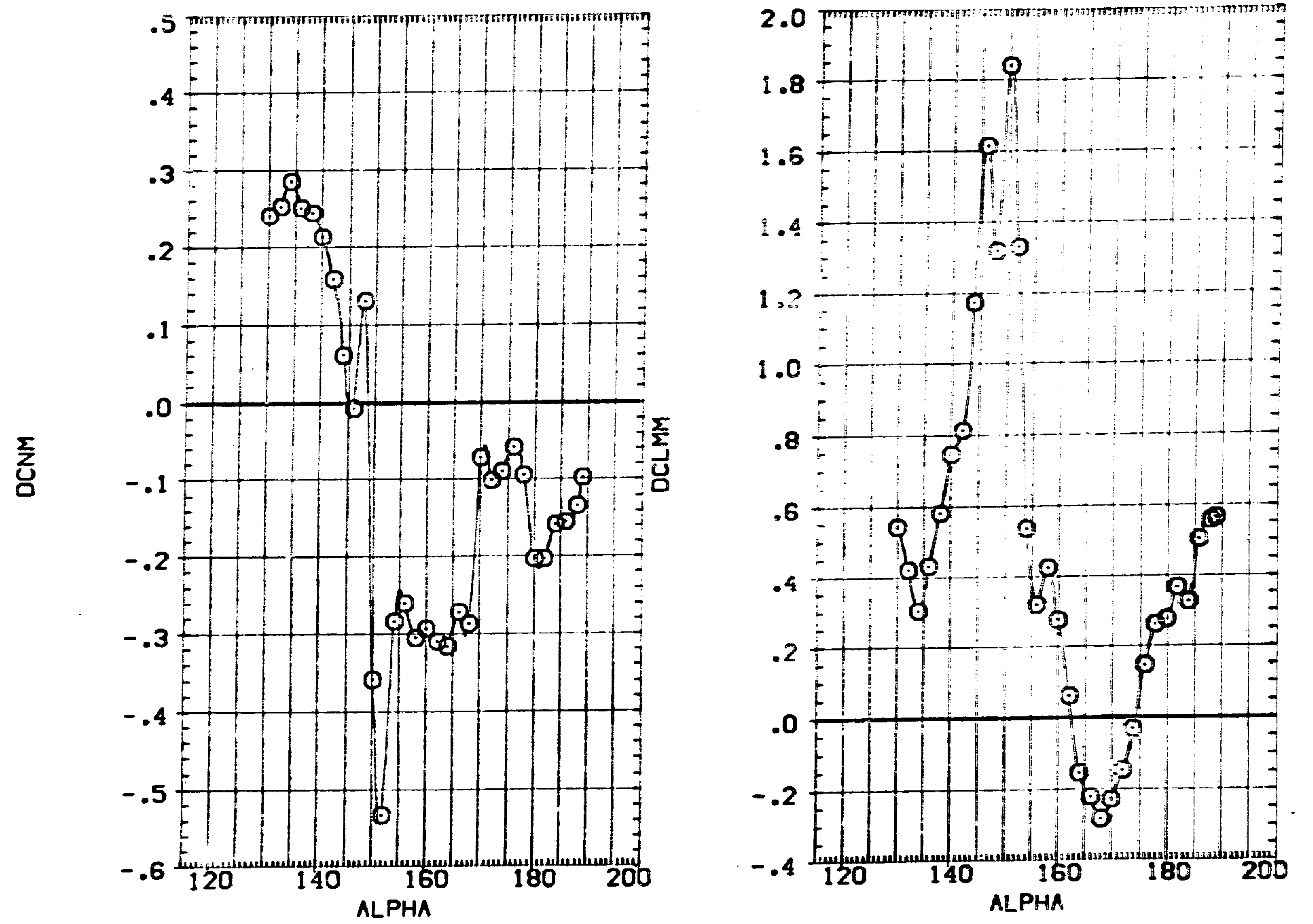
(B)MACH = 3.48

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(D95055)	○	MSFC 590/595 (SA26F) EFFECT OF EIB - EIA

BETA	PHI	ELT	SEPRKT
.000	.000	.000	.000

REFERENCE INFORMATION

SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	

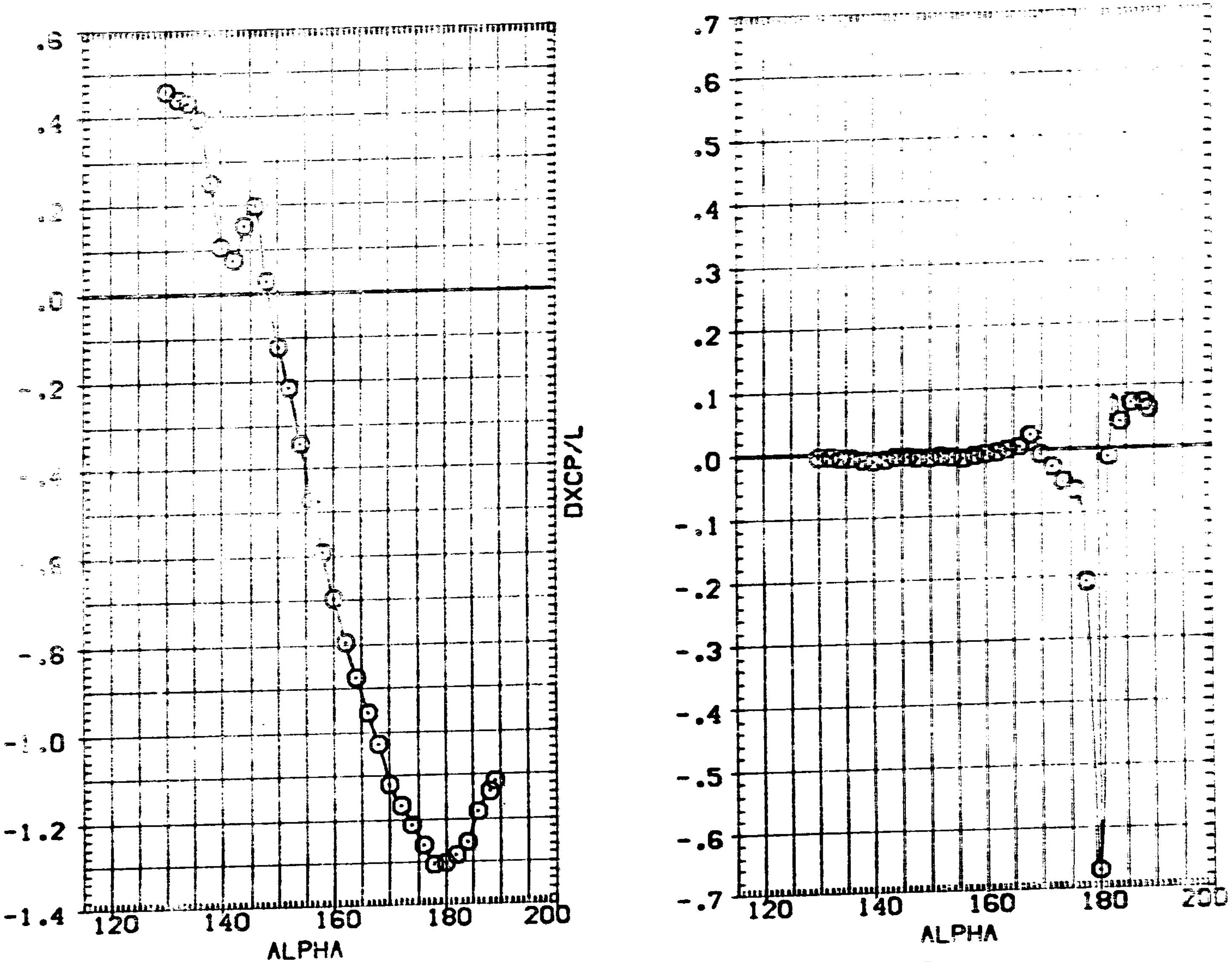


EFFECT OF TRUNCATED NOZZLE ON SRB AERODYNAMIC CHARACTERISTICS

(C)MACH = 4.96

DATA SET SYMBOL CONFIGURATION DESCRIPTION
(D95055) ○ MSFC 590/595 (SA26F) EFFECT OF E1B - E1A

BETA	PHI	ELV	SEPRAT	REFERENCE INFORMATION		
.000	.000	.000	.000	SREF	.5030	SQ.
				LREF	[illegible]	IN.
				BREF	[illegible]	IN.
				XMRP	[illegible]	IN.
				YMRP	[illegible]	IN.
				ZMRP	[illegible]	IN.
				SCALE	[illegible]	

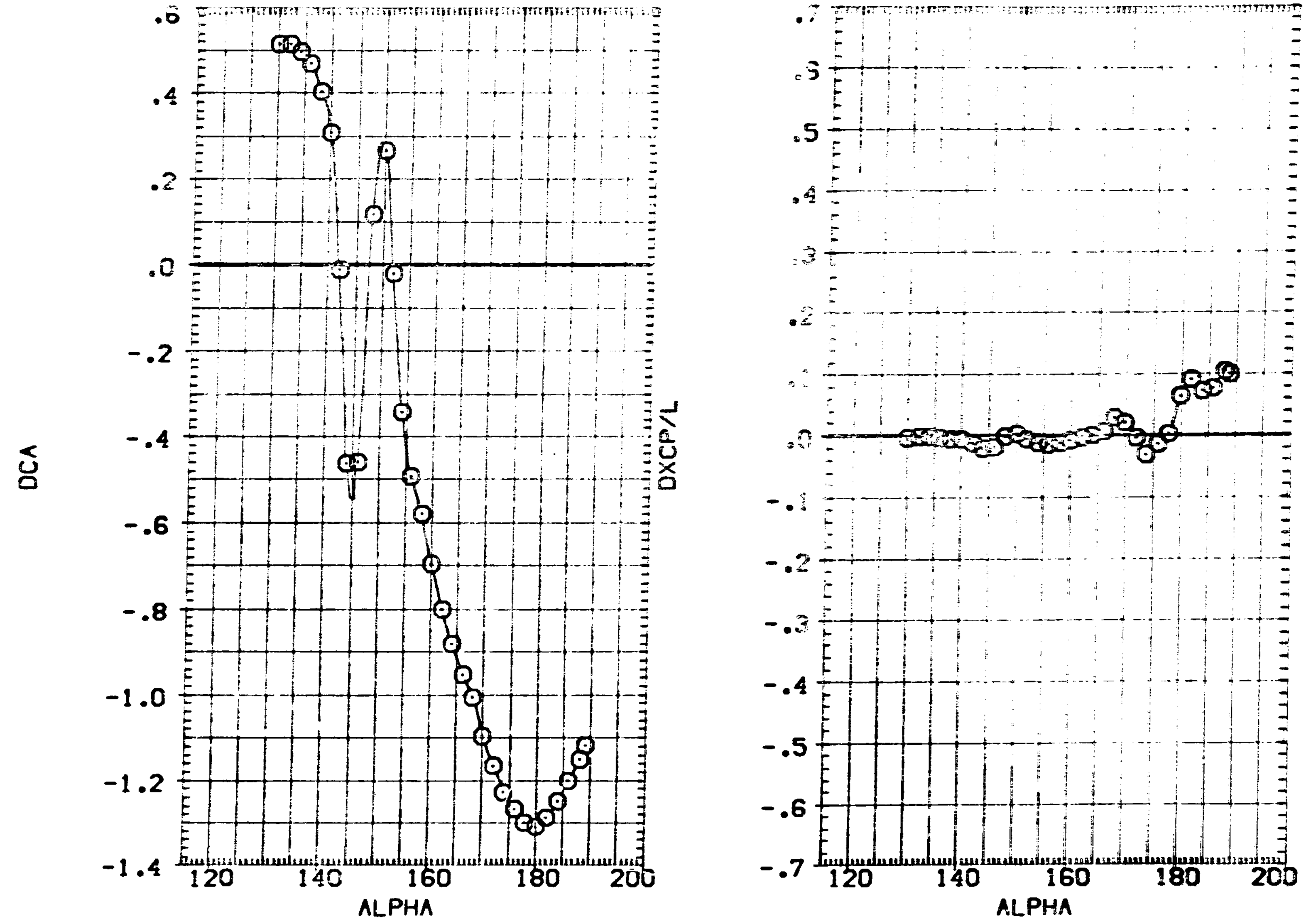


EFFECT OF TRUNCATED NOZZLE ON SRB AERODYNAMIC CHARACTERISTICS

(A)MACH = 2.74

DATA SET SYMBOL CONFIGURATION DESCRIPTION
(D95055) ○ MSFC 590/595 (SA26F) EFFECT OF E1B - E1A

BETA	PHI	ELT	SEPRKT	REFERENCE INFORMATION		
.000	.000	.000	.000	SREF	.5030	SQ. IN
				LREF	.8000	IN.
				BREF	.8000	IN.
				XMRP	5.5570	IN.
				YMRP	.0000	IN.
				ZMRP	.0000	IN.
				SCALE	.0056	



EFFECT OF TRUNCATED NOZZLE ON SRB AERODYNAMIC CHARACTERISTICS

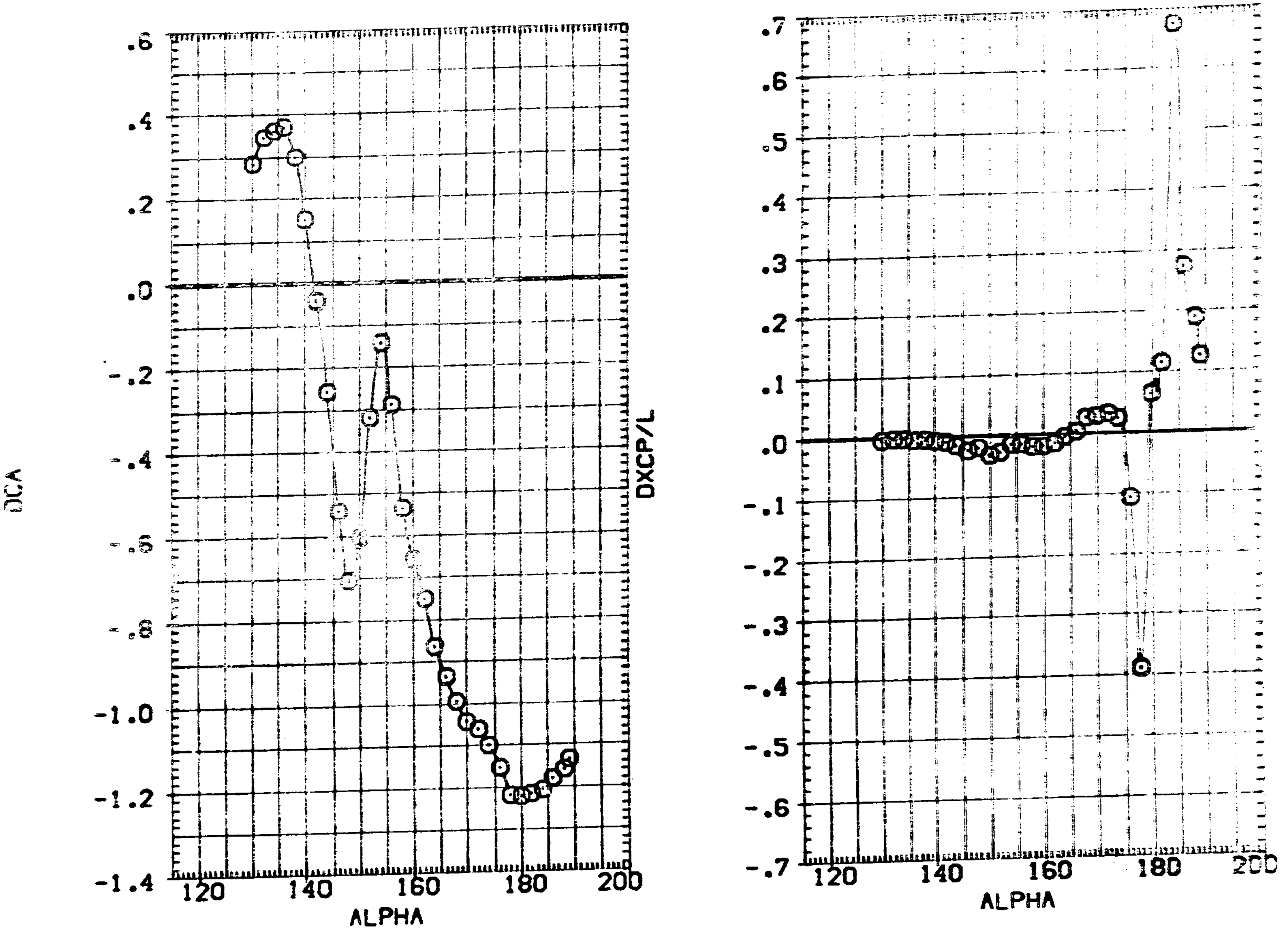
(B)MACH = 3.48

DATA SET SYMBOL CONFIGURATION DESCRIPTION
(D95055) ○ MSFC 590/595 (SA26F) EFFECT OF E1B - E1A

BETA	PHI	ELT	SEPRKT
.000	.000	.000	.000

REFERENCE INFORMATION

SREF	.5030	SQ. IN.
LREF	.6000	IN.
BREF	.3000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	



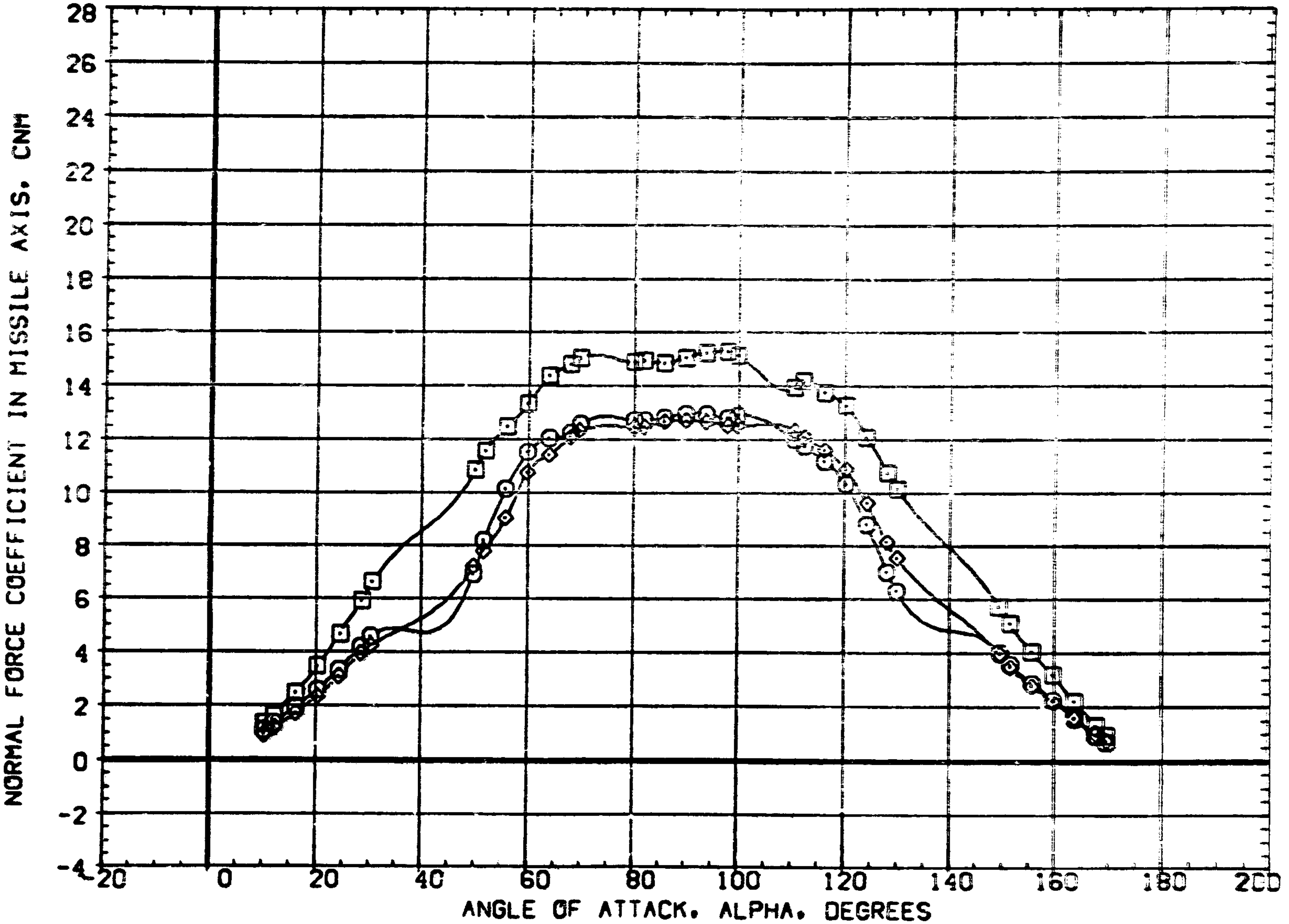
EFFECT OF TRUNCATED NOZZLE ON SRB AERODYNAMIC CHARACTERISTICS

(C)MACH = 4.96

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRKT
(C95103)	○	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	45.000	1.000	1.000
(C95104)	□	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	90.000	1.000	1.000
(C95105)	◇	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	135.000	1.000	1.000

REFERENCE INFORMATION

SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	



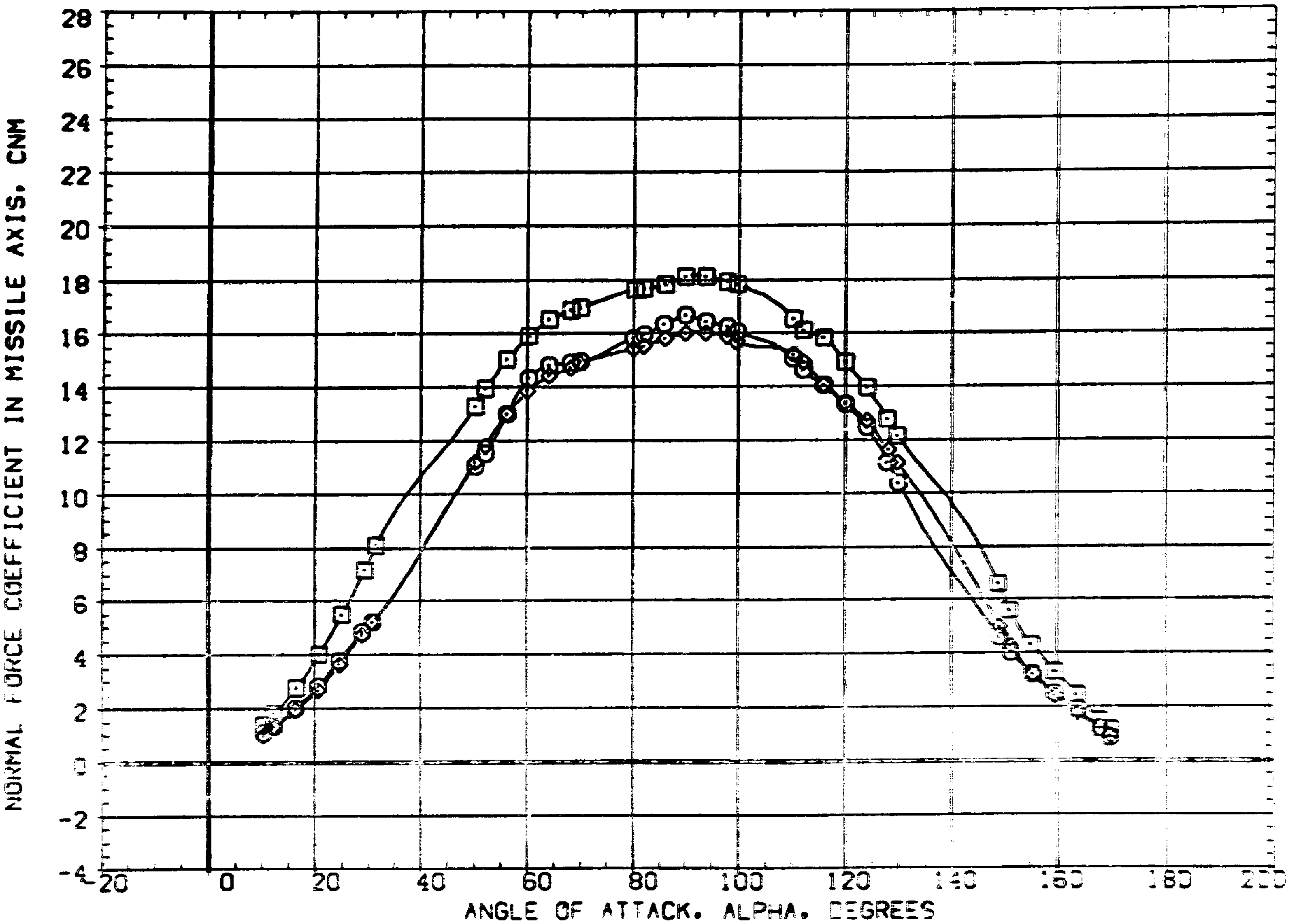
AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

(A)MAC- = .60

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRKT
(C95103)	○	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	45.000	1.000	1.000
(C95104)	□	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	90.000	1.000	1.000
(C95105)	◇	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	135.000	1.000	1.000

REFERENCE INFORMATION

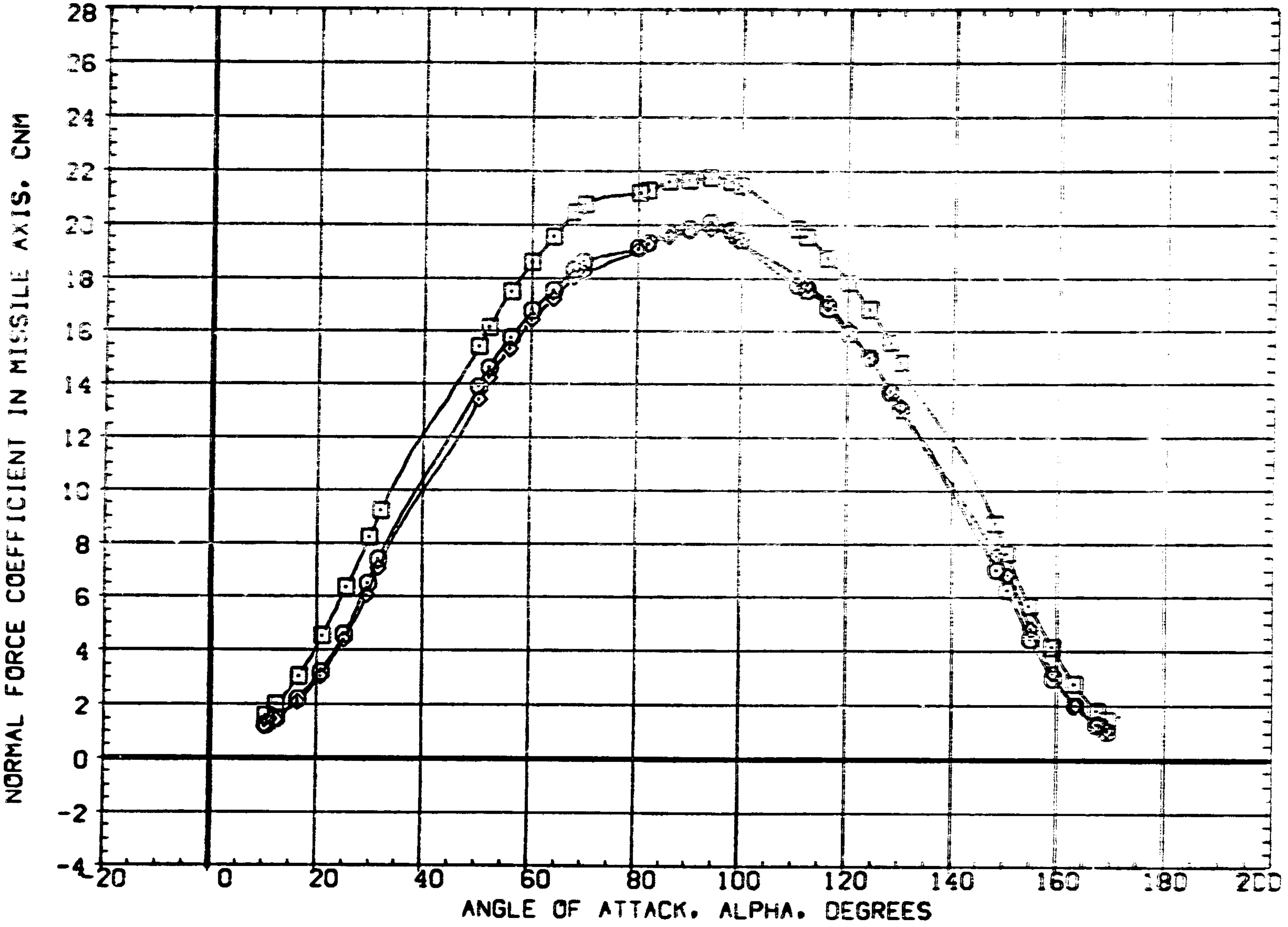
SREF	[illegible]	SQ. IN.
LREF	[illegible]	IN.
BREF	.3000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	



AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

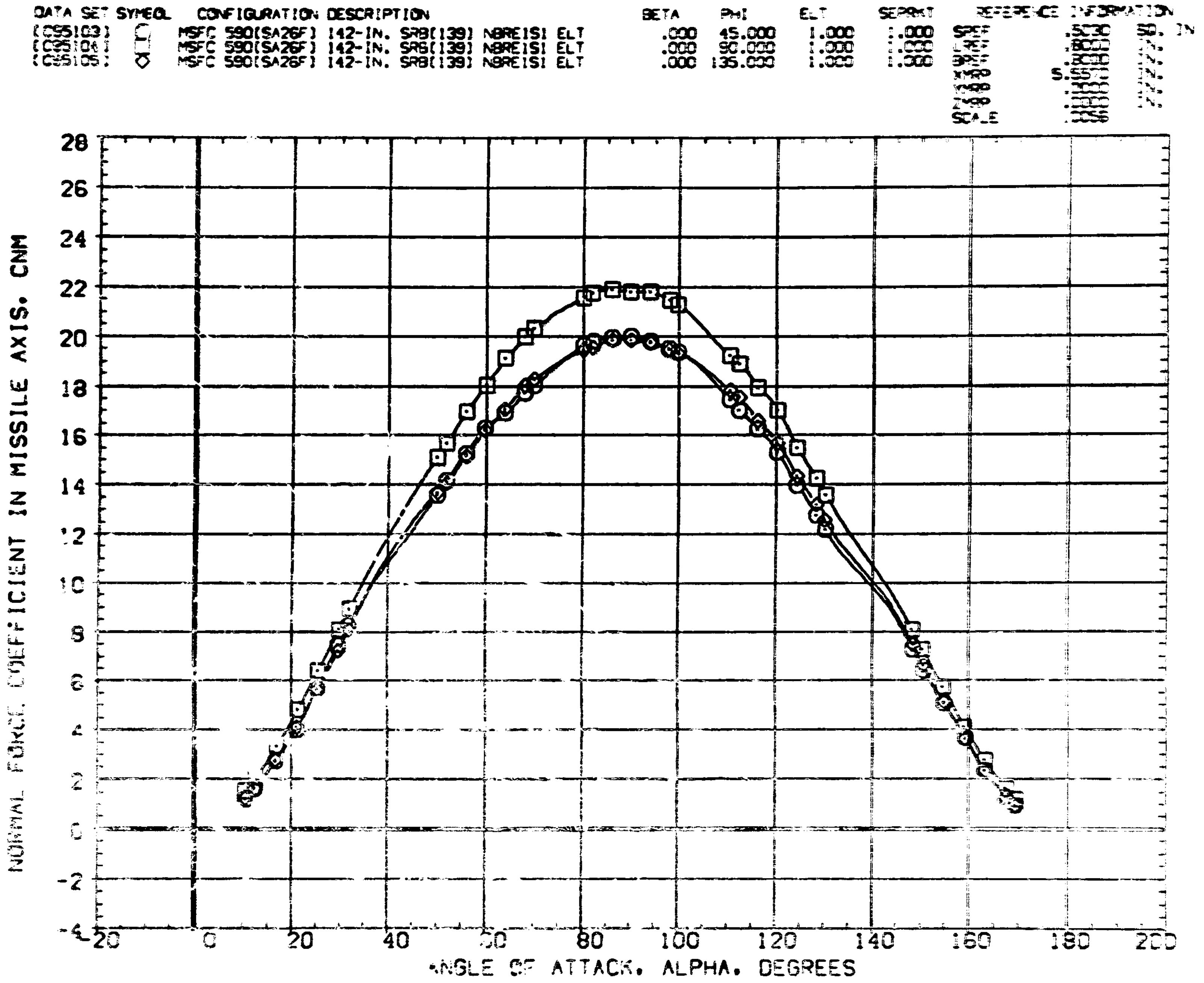
(B)MACH = .90

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRKT	REFERENCE INFORMATION		
(C95103)	○	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	45.000	1.000	1.000	SREF	.5030	SQ. IN
(C95104)	□	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	90.000	1.000	1.000	LREF	.8000	IN.
(C95105)	◇	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	135.000	1.000	1.000	BREF	.8000	IN.
							XMRP	5.5570	IN.
							YMRP	.0000	IN.
							ZMRP	.0000	IN.
							SCALE	.0056	



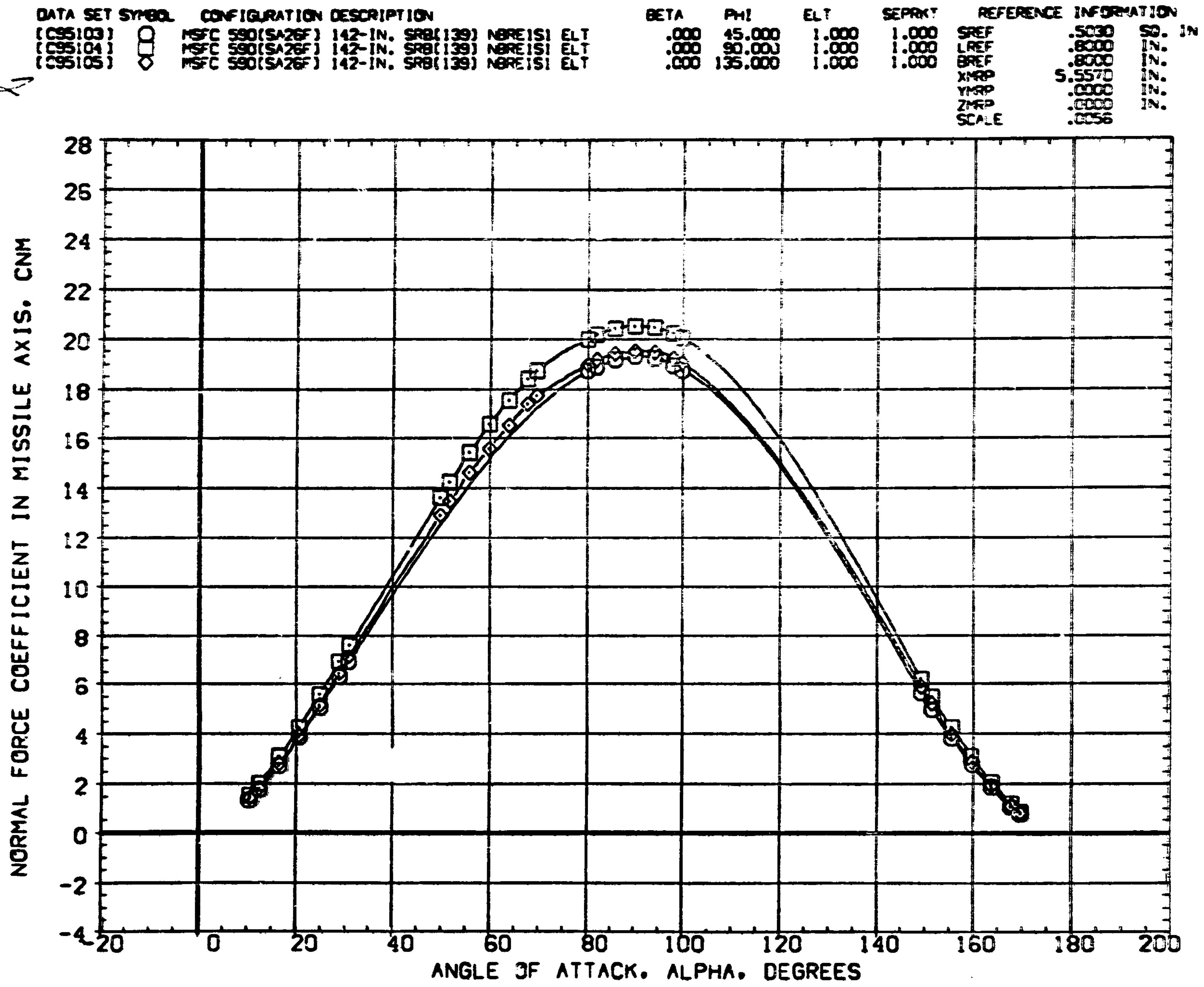
AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

(C)MACH = 1.20



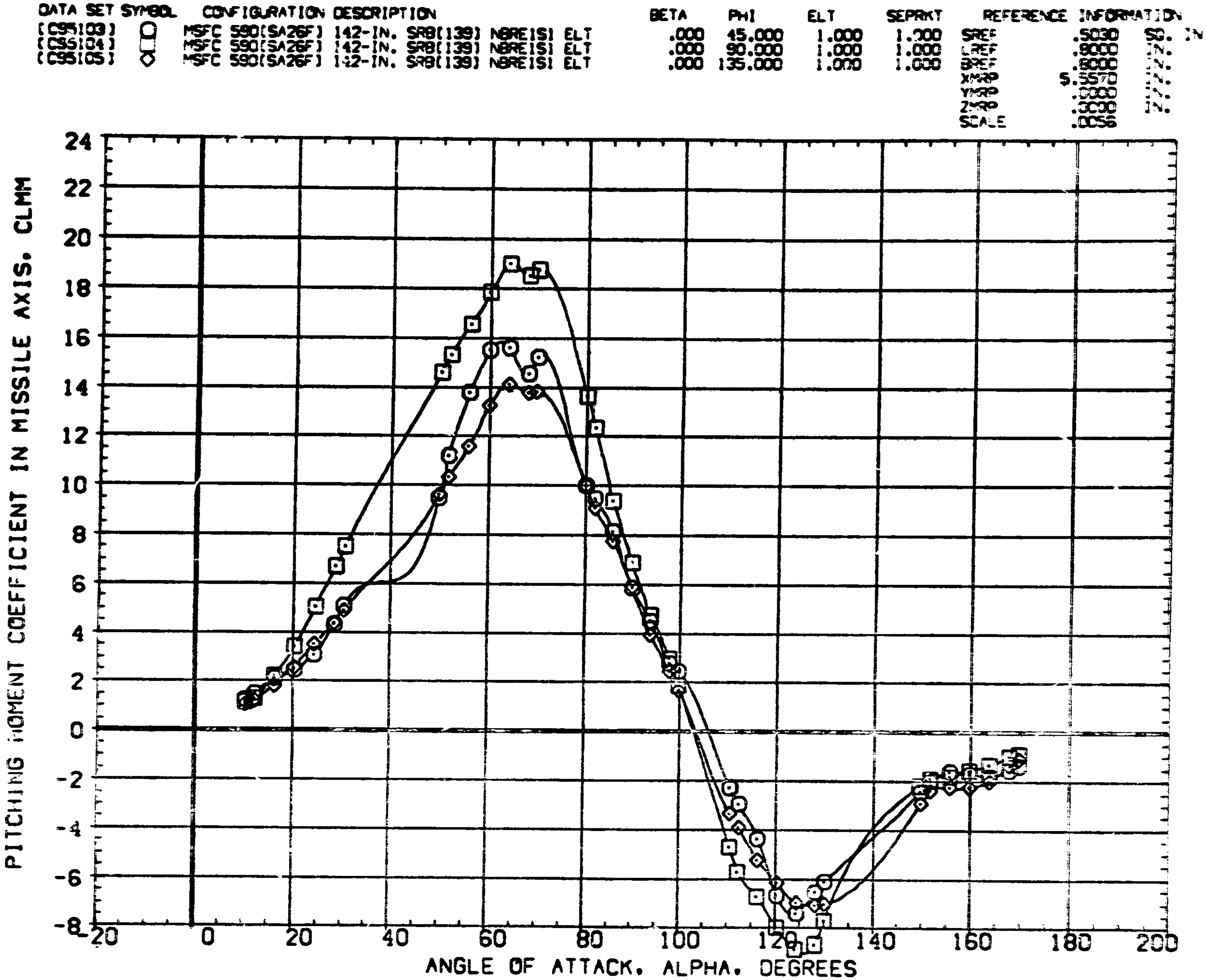
AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

(D)MACH = 1.96



AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

(E)MACH = 3.48



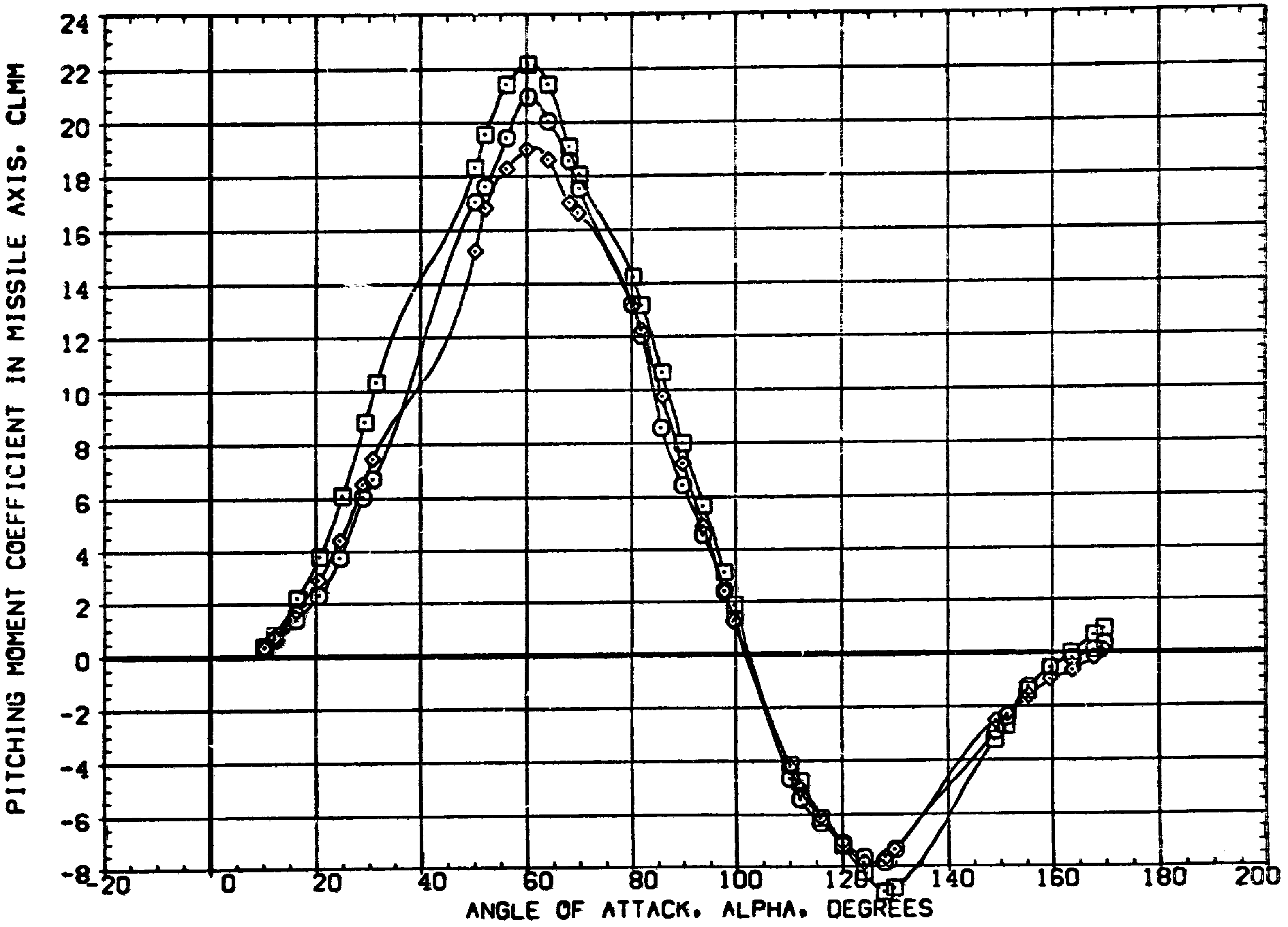
AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

(A)MACH = .60

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRKT
[C95103]	○	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	45.000	1.000	1.000
[C95104]	□	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	90.000	1.000	1.000
[C95105]	◇	MSFC 590(SA26F) 142-IN. SRB([illegible]) NBRE(S) ELT	.000	135.000	1.000	1.000

REFERENCE INFORMATION

SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	

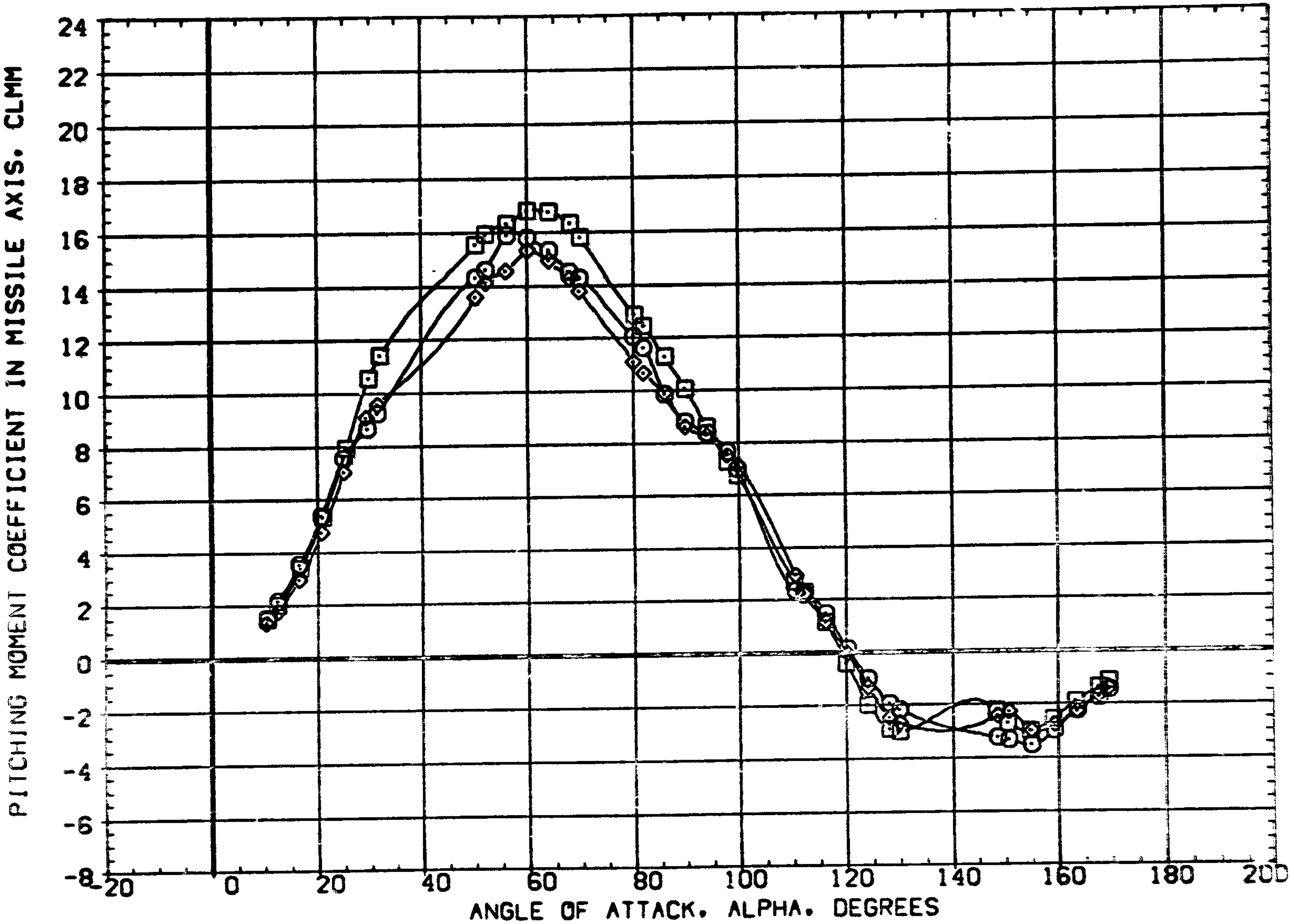


AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

(B)MACH = .90

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRKT
(C95103)	○	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	45.000	1.000	1.000
(C95104)	□	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	90.000	1.000	1.000
(C95105)	◇	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	135.000	1.000	1.000

REFERENCE INFORMATION		
SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	

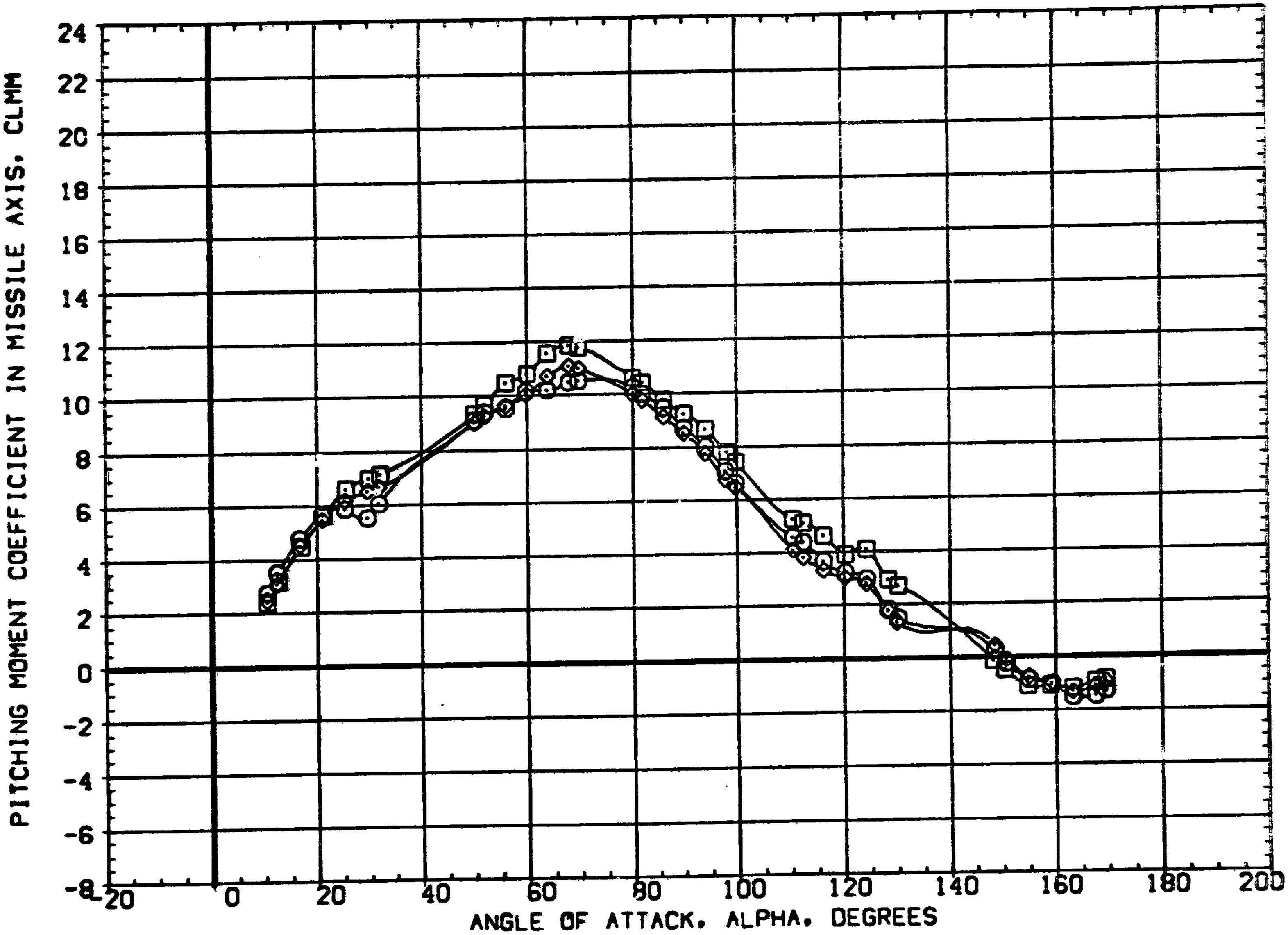


AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

(C)MACH = 1.20

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRKT
(C95103)	○	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	45.000	1.000	1.000
(C95104)	□	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	90.000	1.000	1.000
(C95105)	◇	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	135.000	1.000	1.000

REFERENCE INFORMATION		
SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	

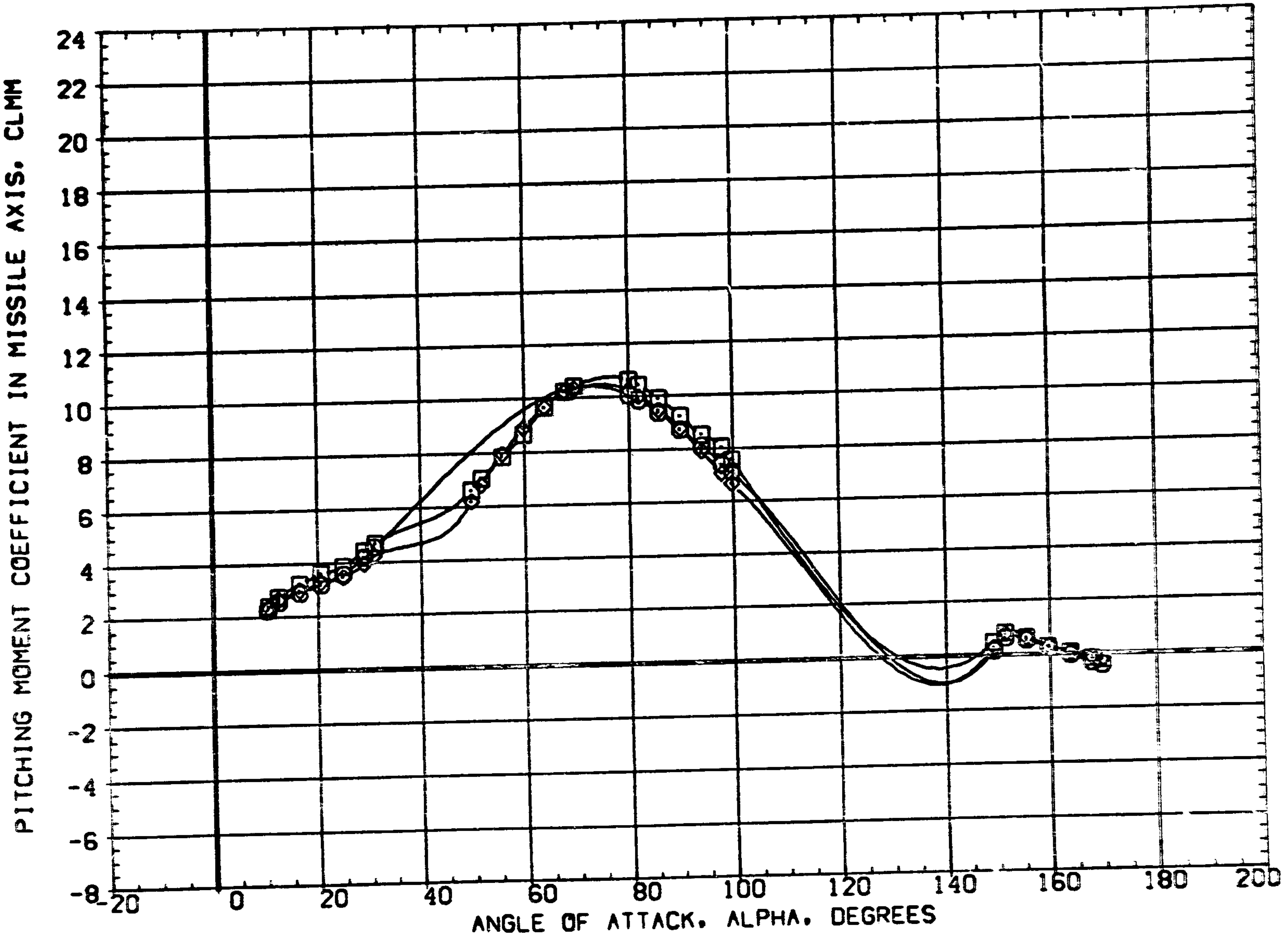


AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

(D)MACH = 1.96

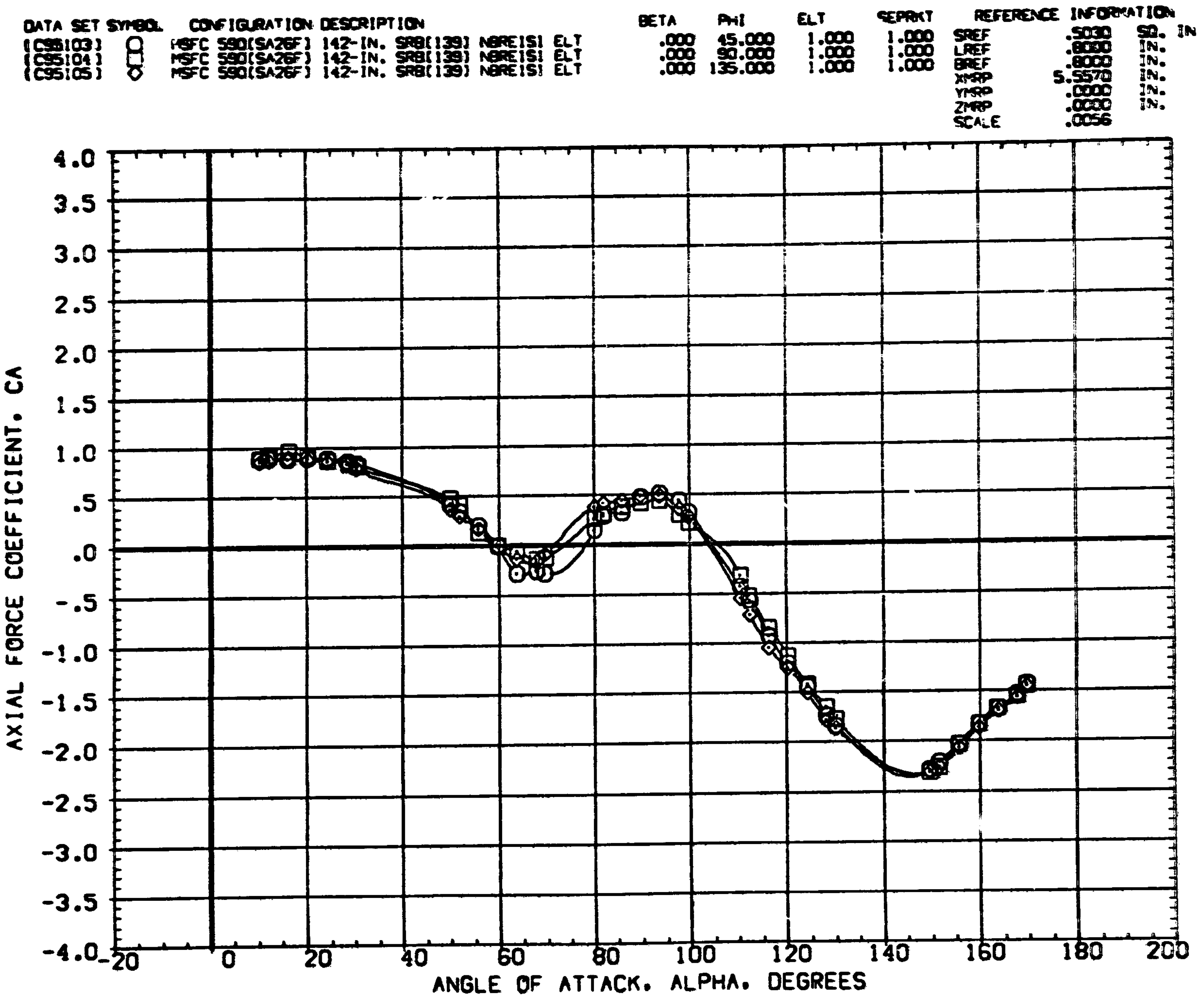
DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRKT
[C95!03]	○	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	45.000	1.000	1.000
[C95!04]	□	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	90.000	1.000	1.000
[C95!05]	◇	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	135.000	1.000	1.000

REFERENCE INFORMATION		
SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	



AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

(E)MACH = 3.48

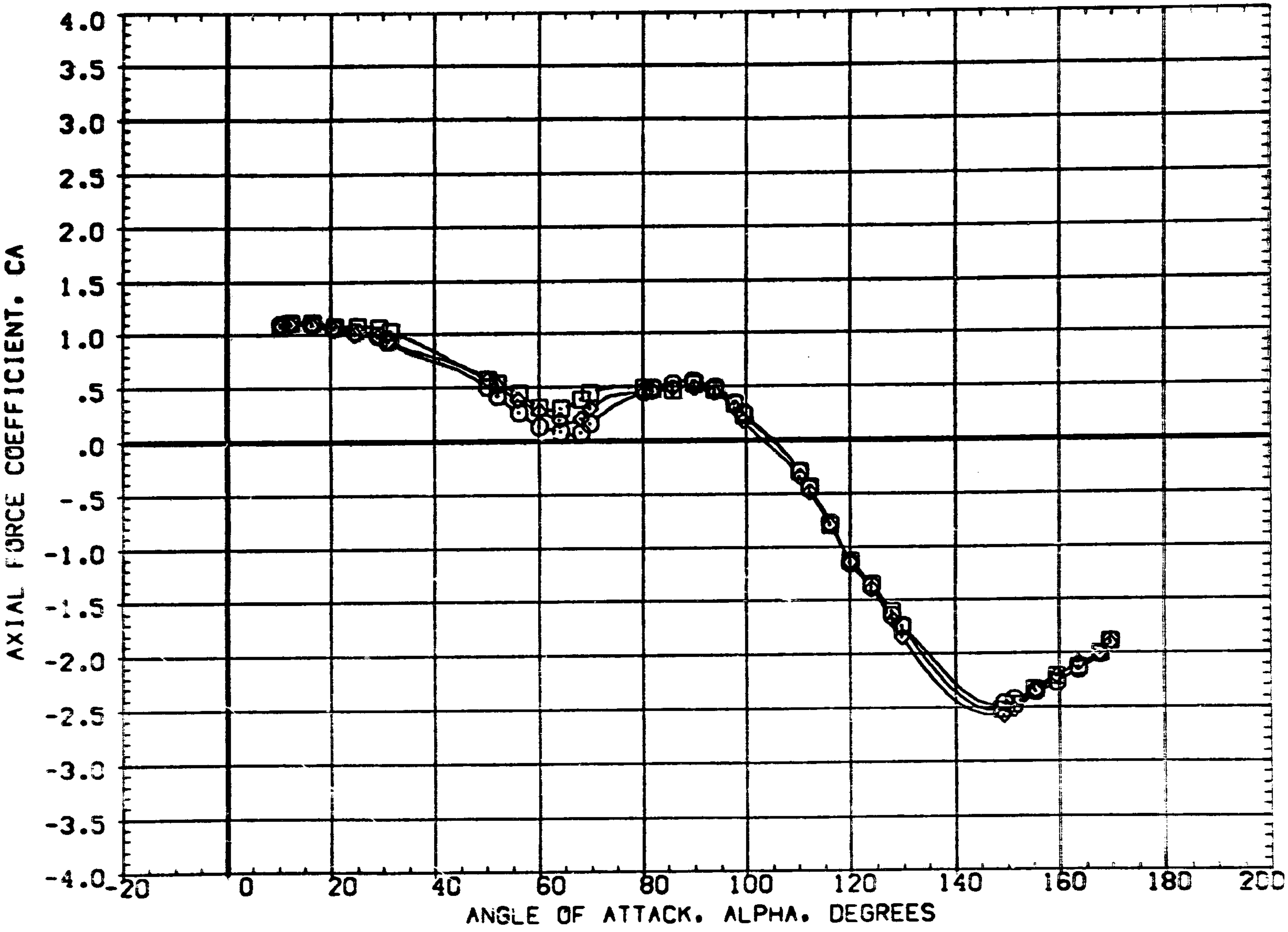


AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

(A)MACH = .60

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRKT
(C95103)	○	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	45.000	1.000	1.000
(C95104)	□	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	90.000	1.000	1.000
(C95105)	◇	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	135.000	1.000	1.000

REFERENCE INFORMATION		
SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	

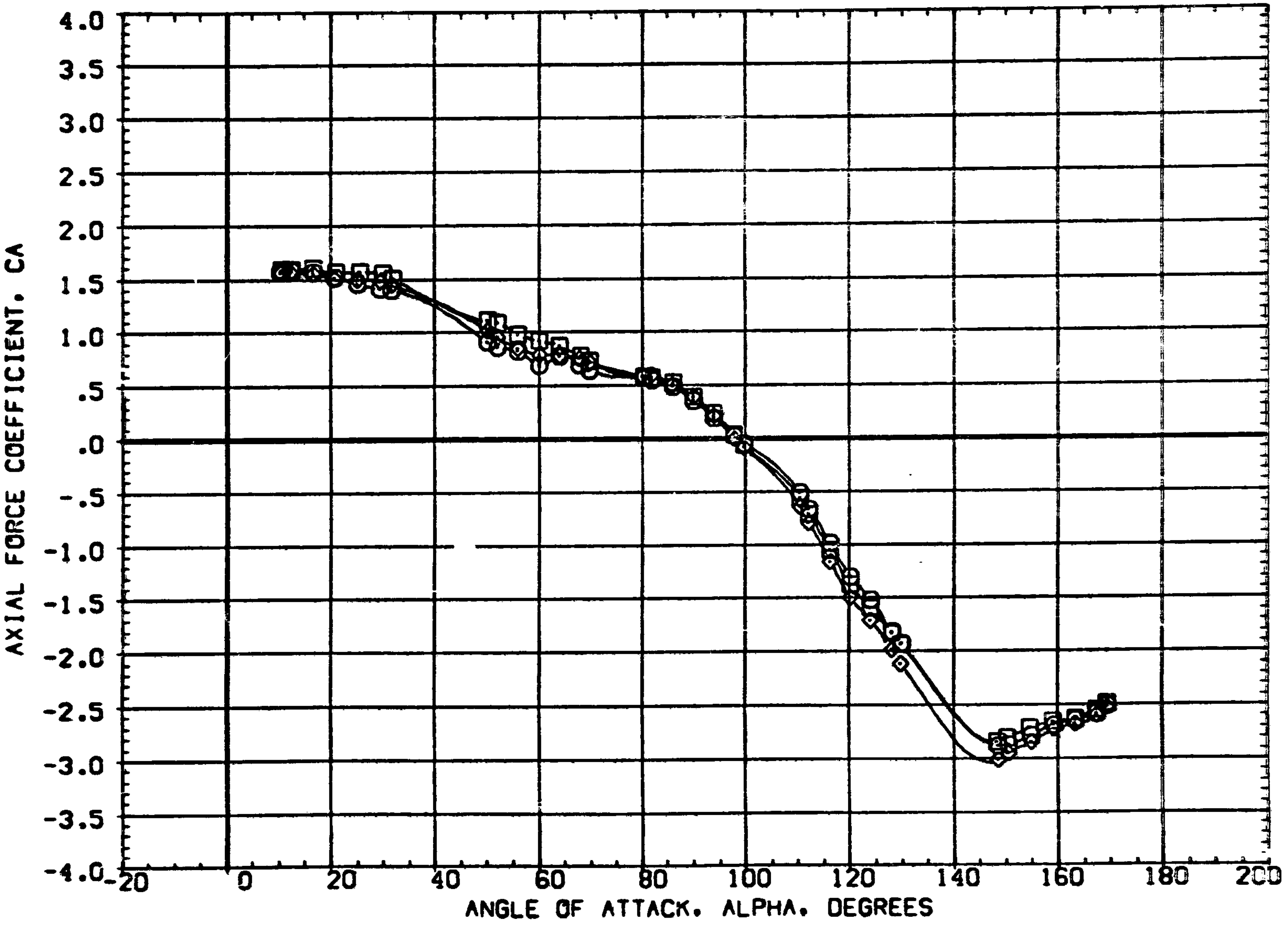


AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

(B)MAC- = .90

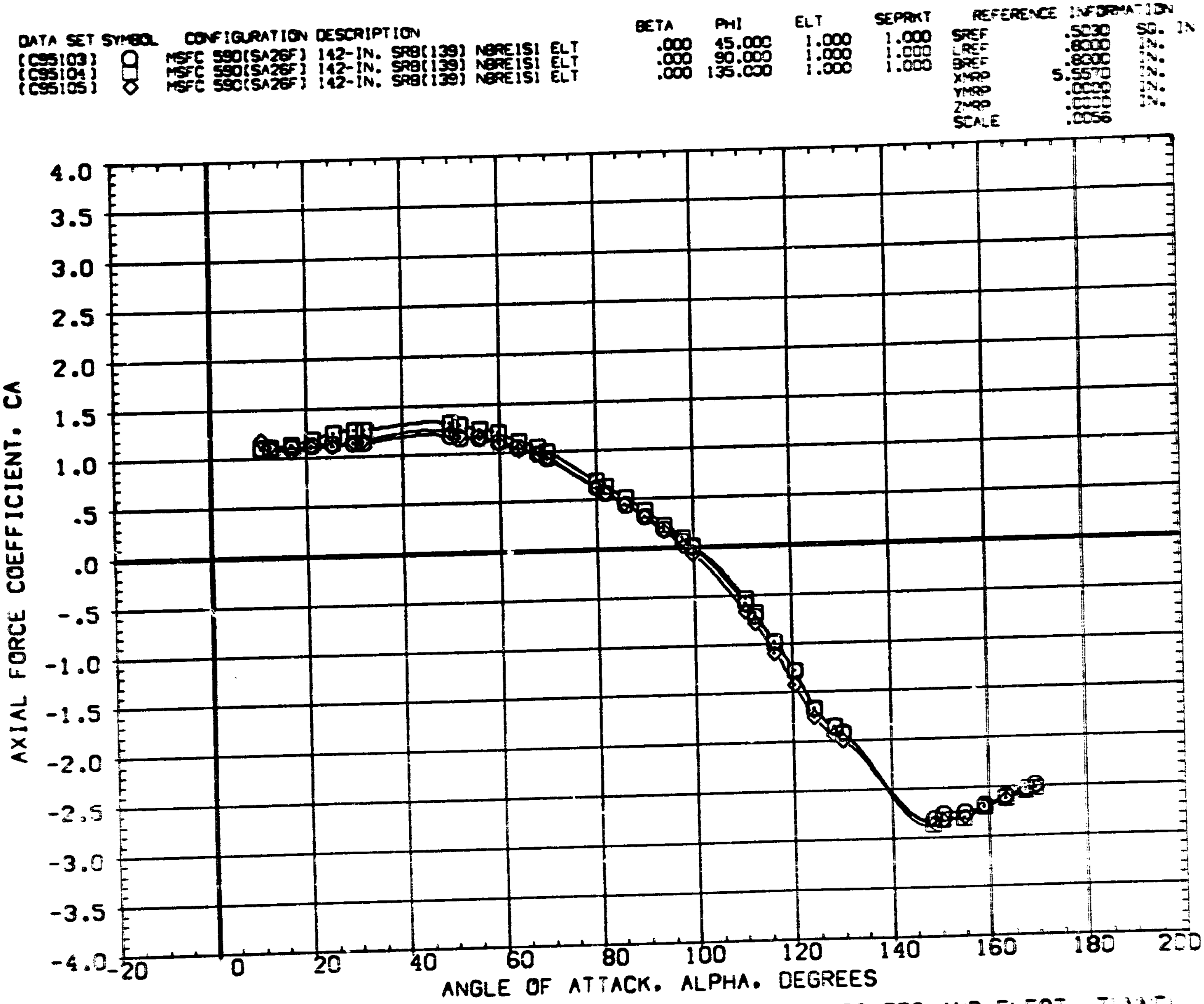
DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRKT
(C95103)	○	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	45.000	1.000	1.000
(C95104)	□	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	90.000	1.000	1.000
(C95105)	◇	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	135.000	1.000	1.000

REFERENCE	INFORMATION	
SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	



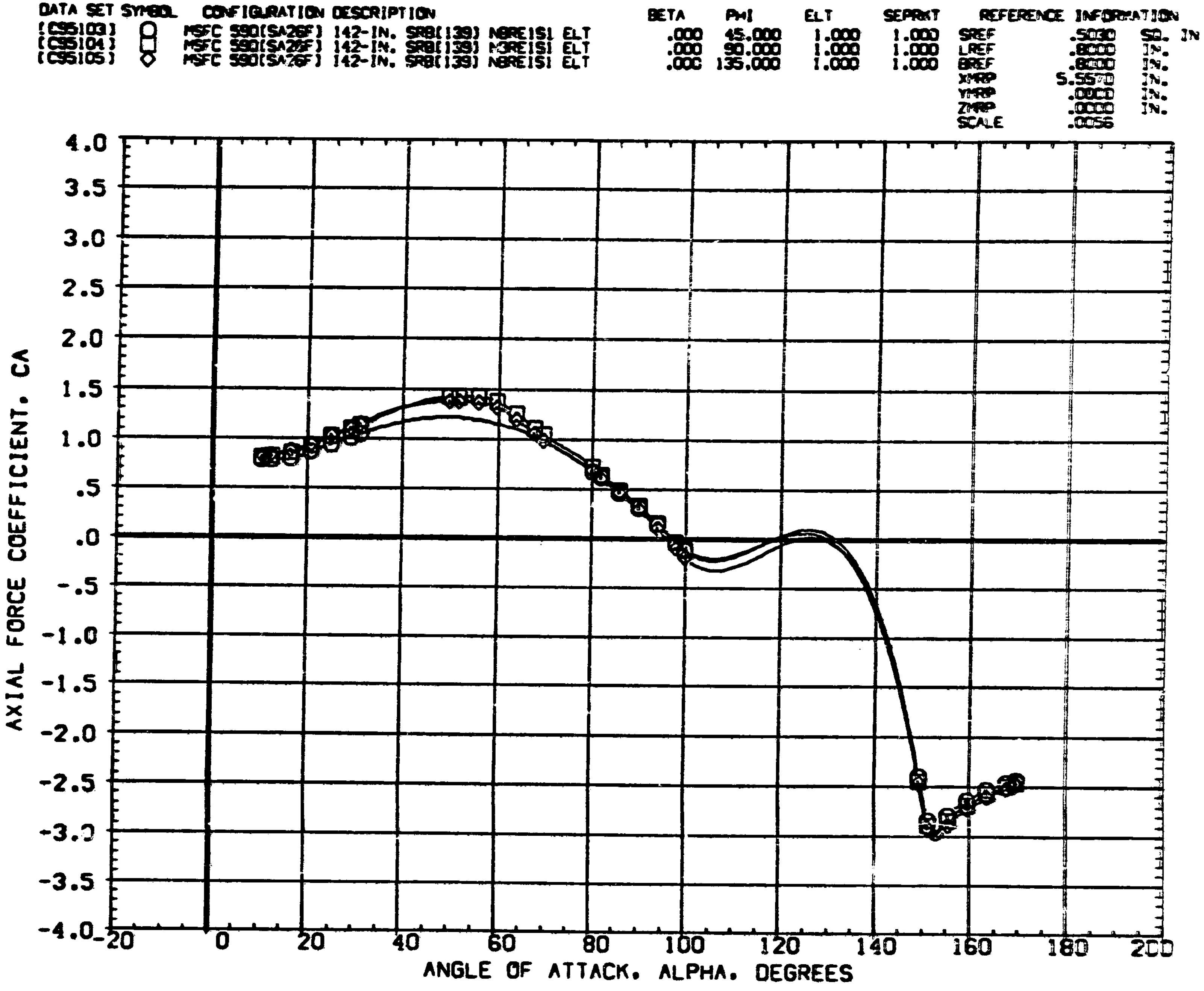
AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

(C)MACH = 1.20



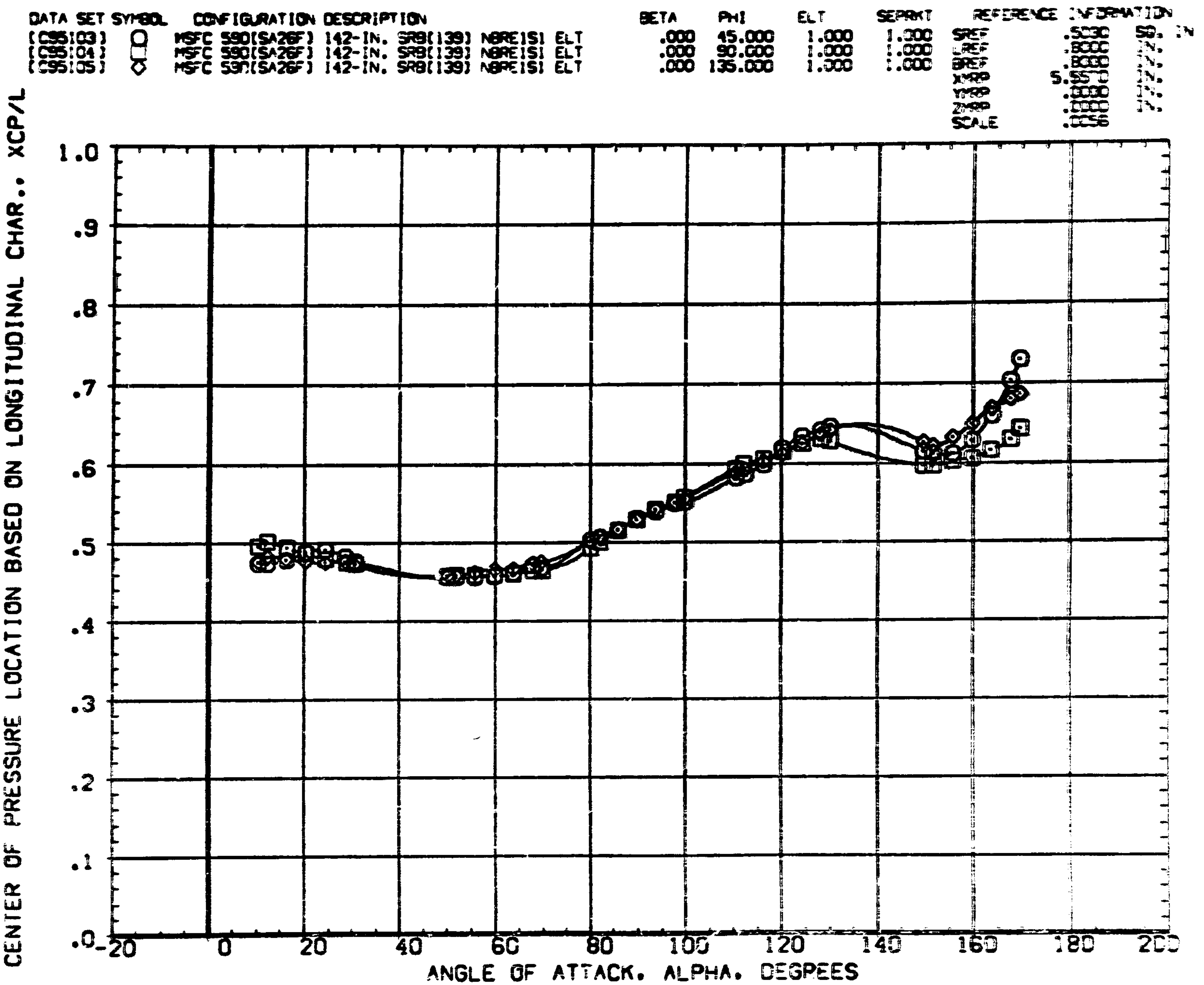
AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

(D)MACH = 1.96



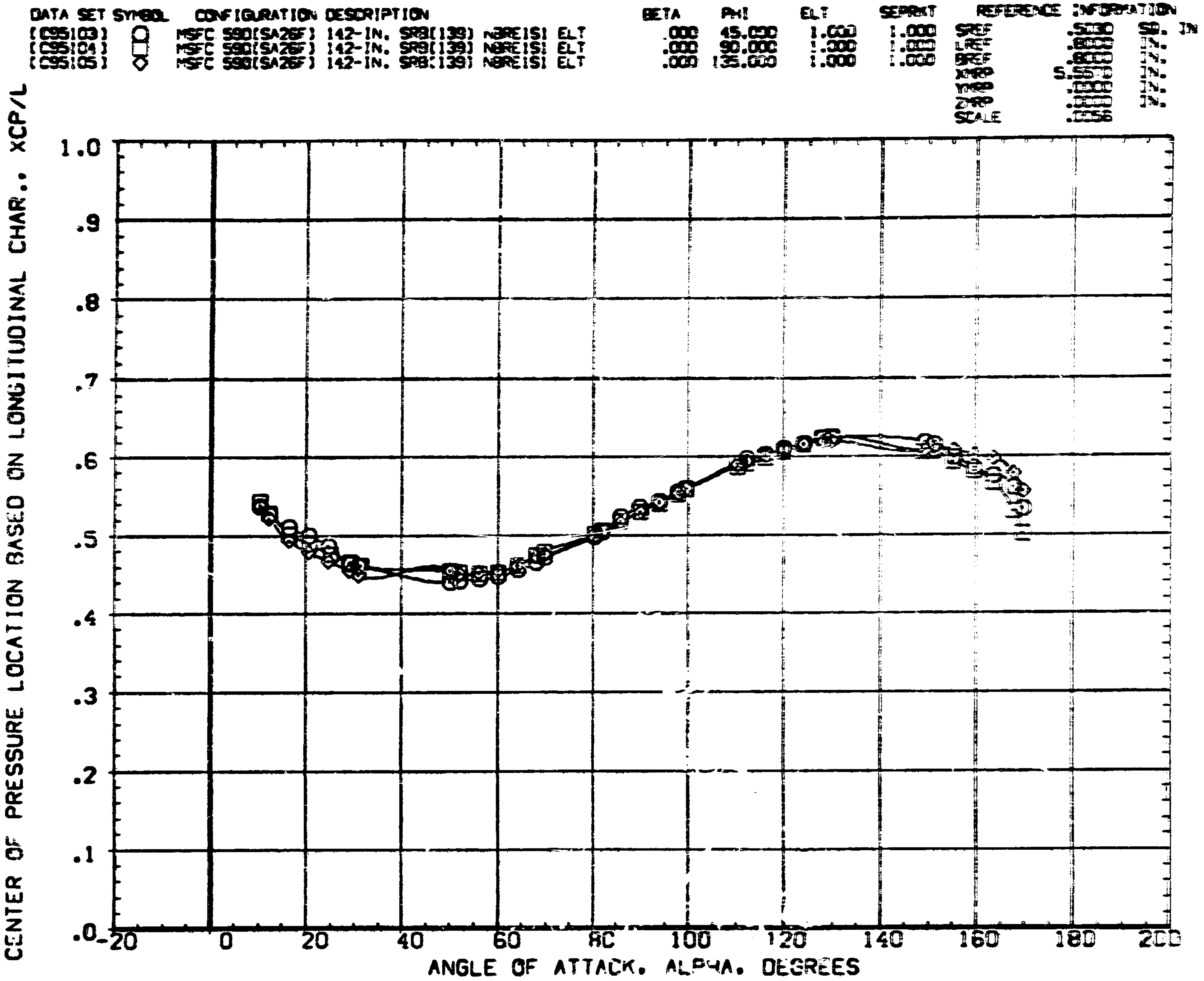
AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

(E)MACH = 3.48



AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

(A)MACH = .60



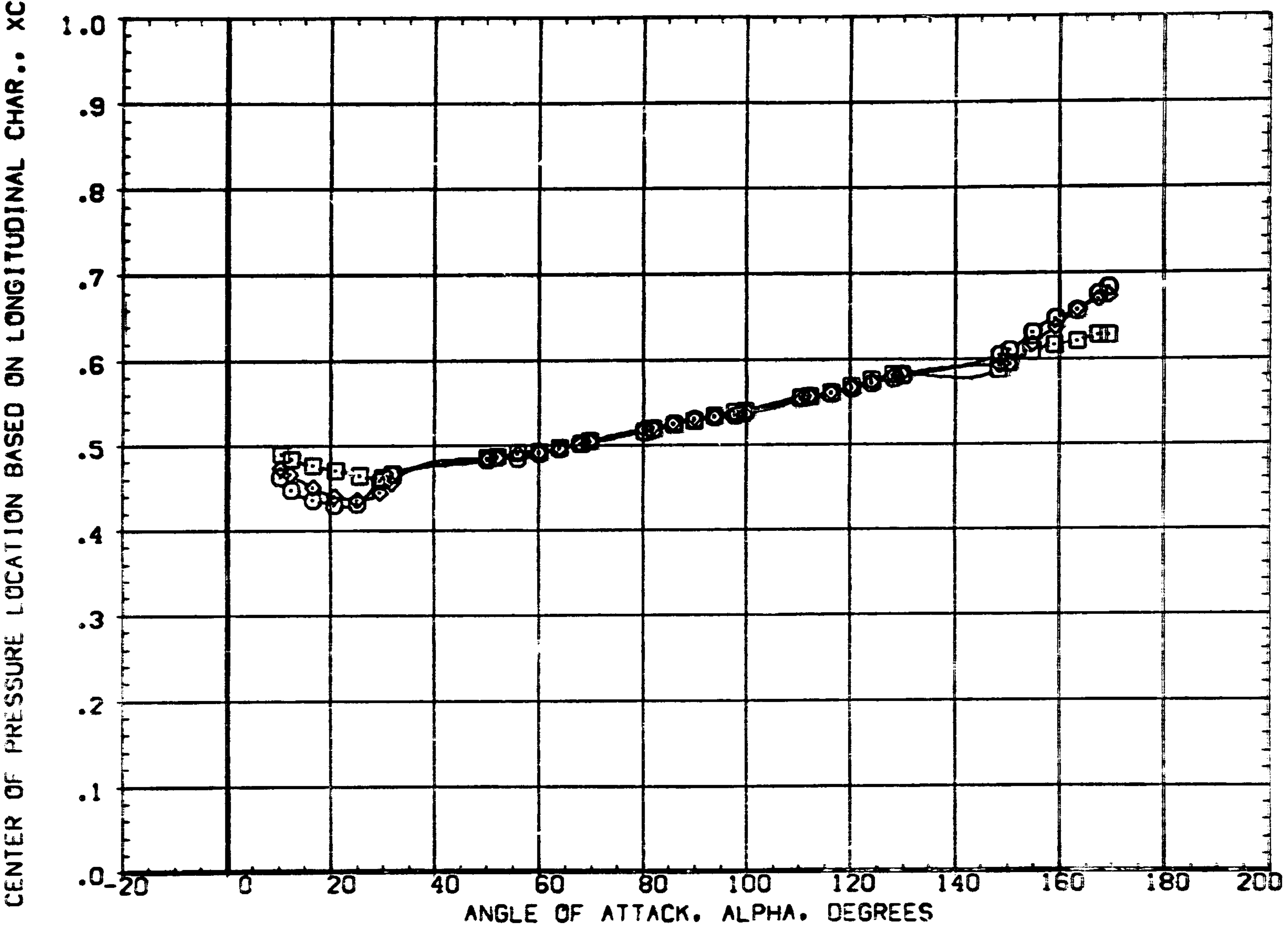
AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

(B)MACH = .90

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRKT
(C95:03)	○	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	45.000	1.000	1.000
(C95:04)	□	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	90.000	1.000	1.000
(C95:05)	◇	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	135.000	1.000	1.000

REFERENCE INFORMATION

SREF	.5030	SQ. IN.
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	

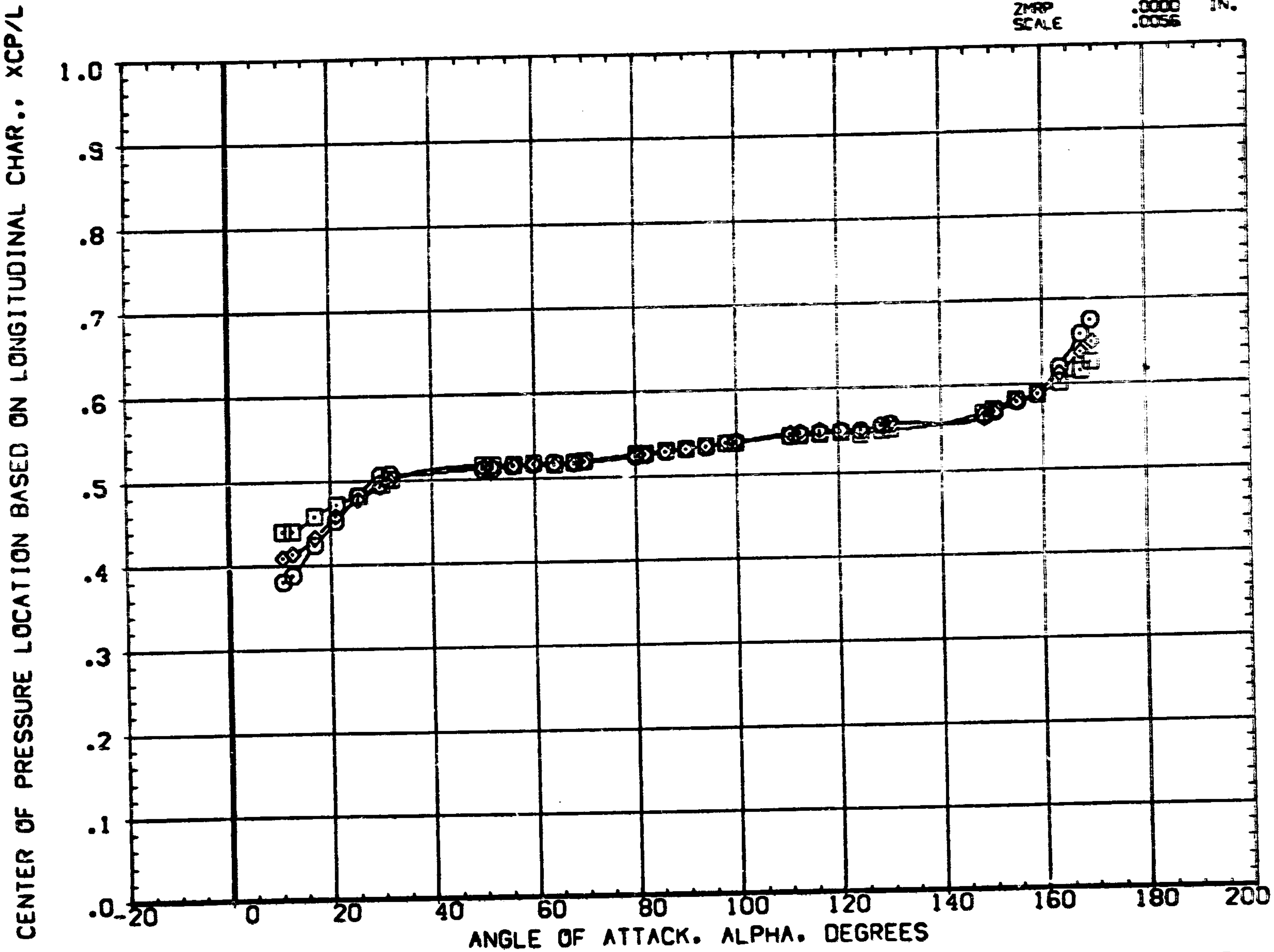


AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

(C)MACH = 1.20

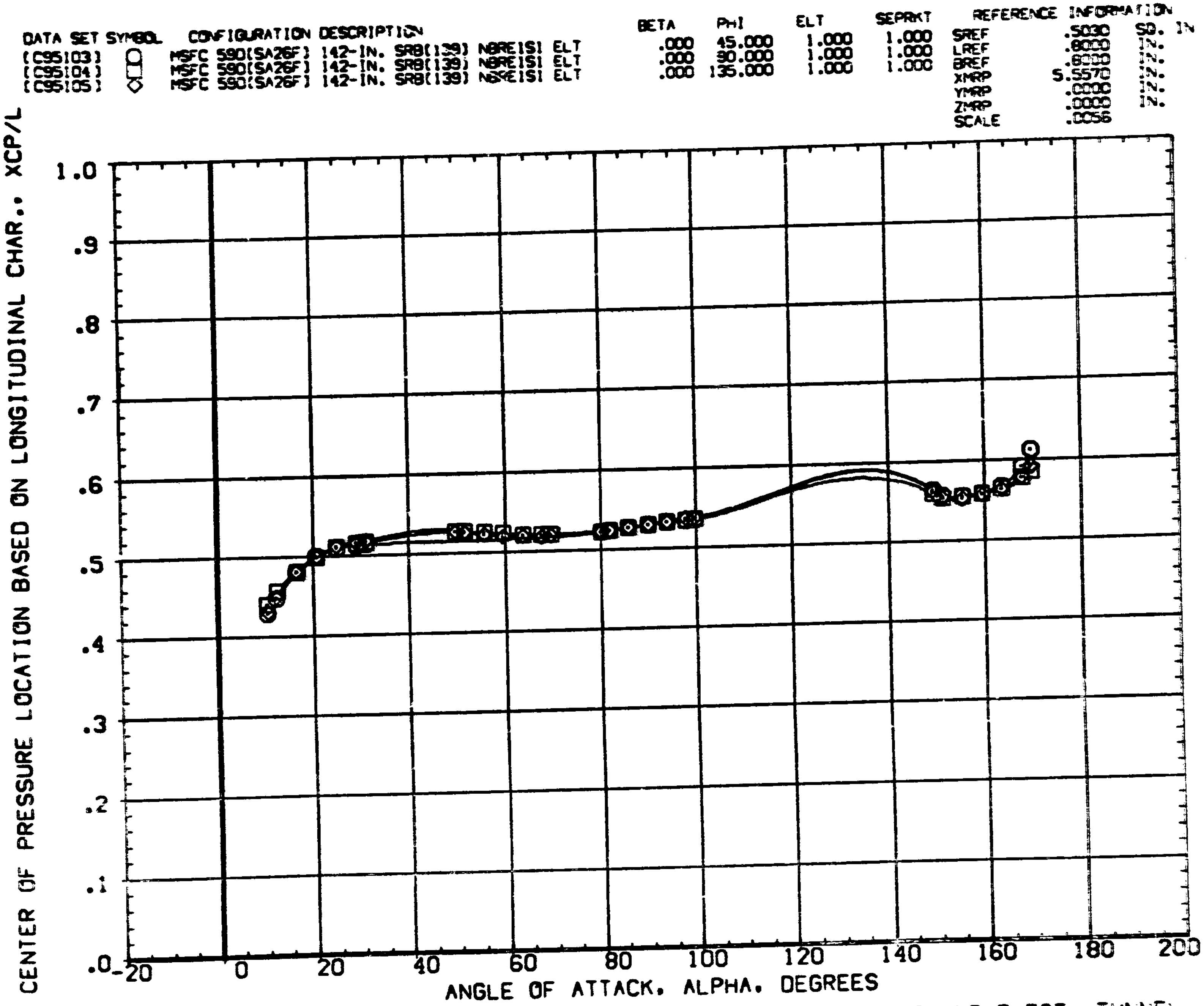
DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRKT
(C95103)	□	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	45.000	1.000	1.000
(C95104)	○	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	90.000	1.000	1.000
(C95105)	◇	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	135.000	1.000	1.000

REFERENCE	INFORMATION	
SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	



AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

(C)MACH = 1.96

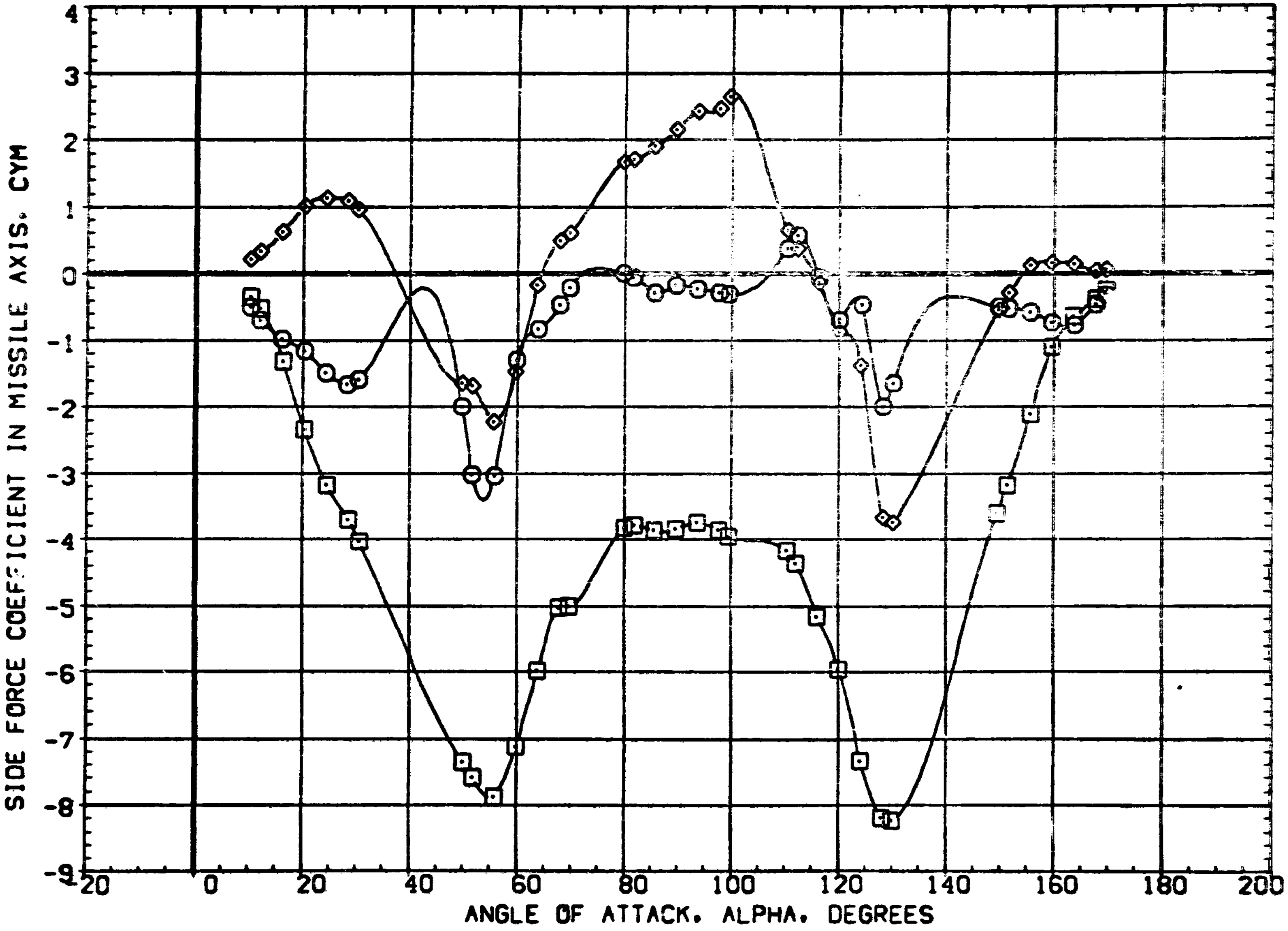


AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

(E)MACH = 3.48

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRKT
(C95103)	○	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	45.000	1.000	1.000
(C95104)	□	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	90.000	1.000	1.000
(C95105)	◇	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	135.000	1.000	1.000

REFERENCE INFORMATION		
SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	

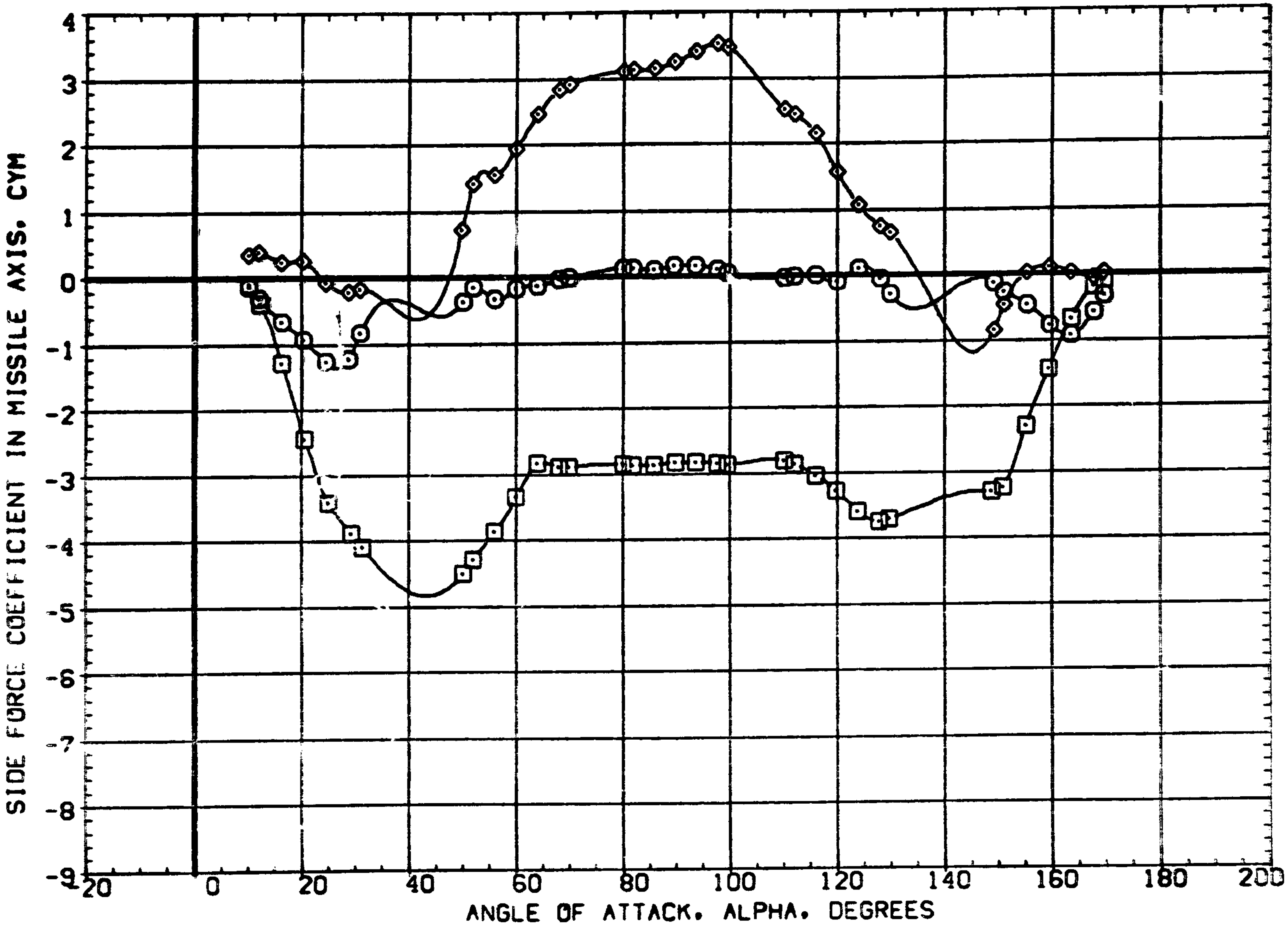


AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

(A)MACH = .60

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRKT
(C95103)	○	MSFC 590(SA26F) 142-IN. SRB(139) NBREIS) ELT	.000	45.000	1.000	1.000
(C95104)	⊡	MSFC 590(SA26F) 142-IN. SRB(139) NBREIS) ELT	.000	90.000	1.000	1.000
(C95105)	◇	MSFC 590(SA26F) 142-IN. SRB(139) NBREIS) ELT	.000	135.000	1.000	1.000

REFERENCE	INFORMATION	
SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	

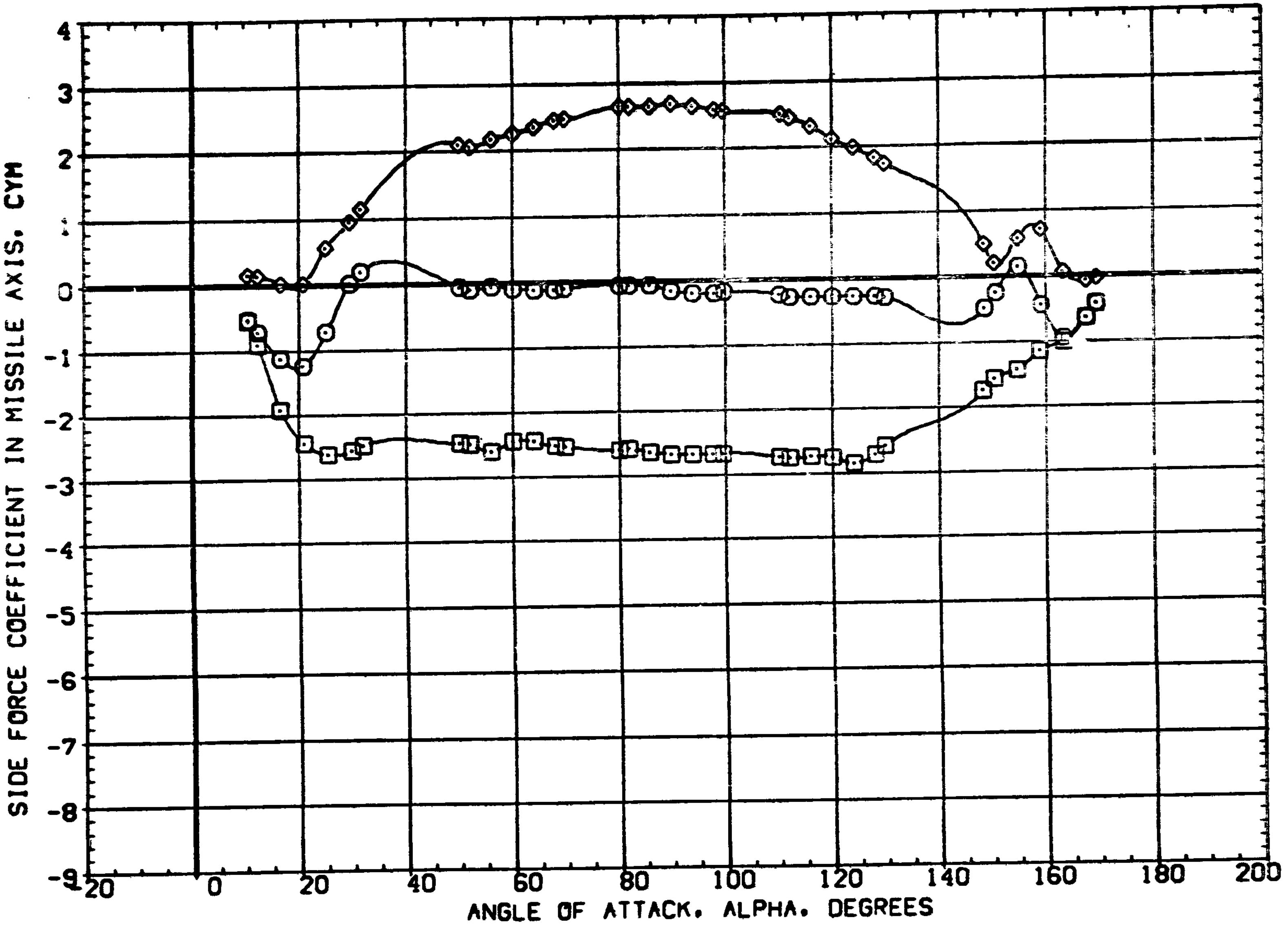


AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

(B)MACH = .90

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRKT
(C95103)	○	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	45.000	1.000	1.000
(C95104)	□	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	90.000	1.000	1.000
(C95105)	◇	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	135.000	1.000	1.000

REFERENCE INFORMATION		
SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	

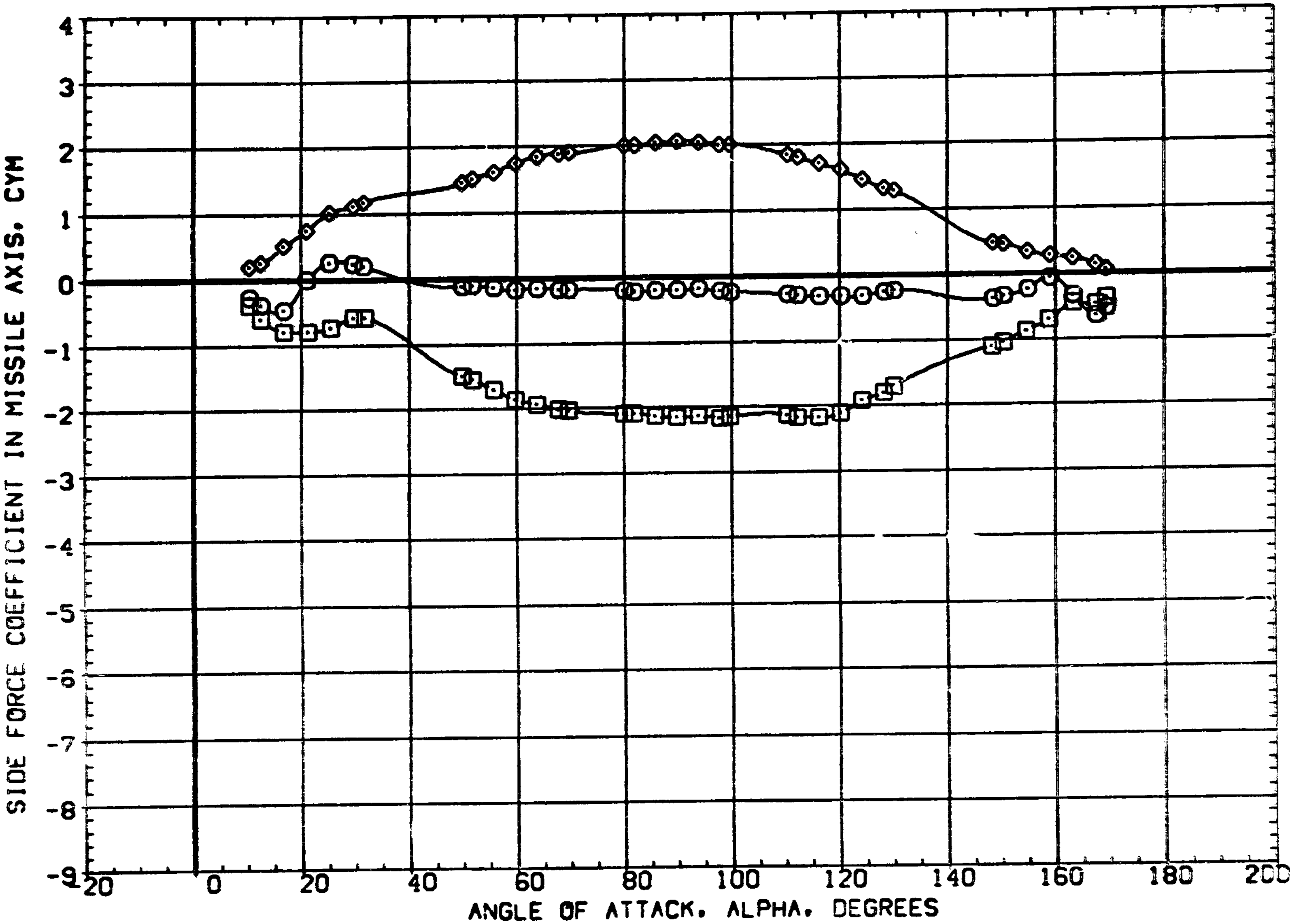


AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

(C)MACH = 1.20

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRKT
[C95103]	○	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	45.000	1.000	1.000
[C95104]	□	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	90.000	1.000	1.000
[C95105]	◇	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	135.000	1.000	1.000

REFERENCE INFORMATION		
SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	

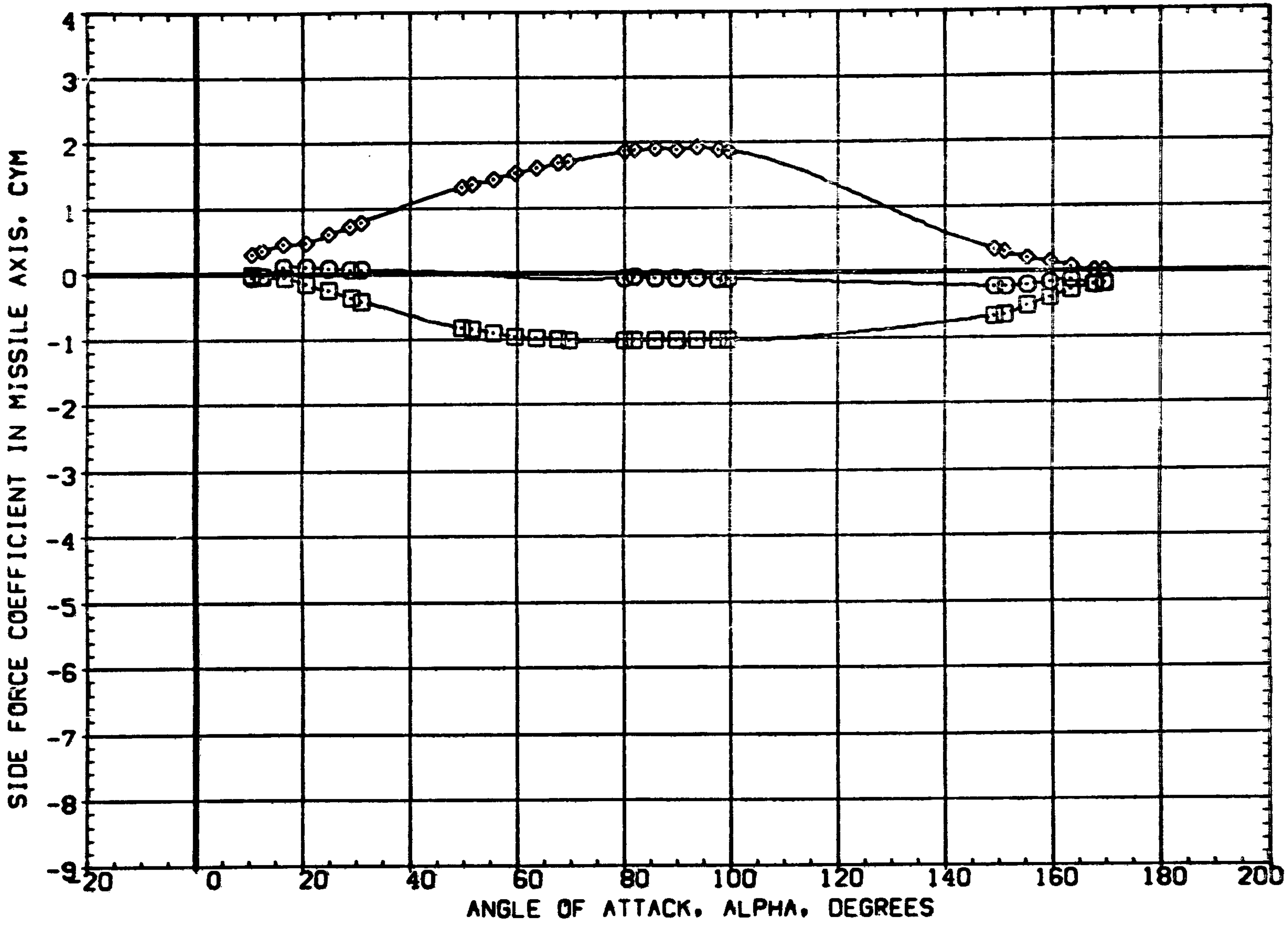


AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

(D)MACH = 1.96

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRKT
[C95103]	○	MSFC 590[SA26F] 142-IN. SRB[139] NBRE[S] ELT	.000	45.000	1.000	1.000
[C95104]	□	MSFC 590[SA26F] 142-IN. SRB[139] NBRE[S] ELT	.000	90.000	1.000	1.000
[C95105]	◇	MSFC 590[SA26F] 142-IN. SRB[139] NBRE[S] ELT	.000	135.000	1.000	1.000

REFERENCE	INFORMATION	
SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	

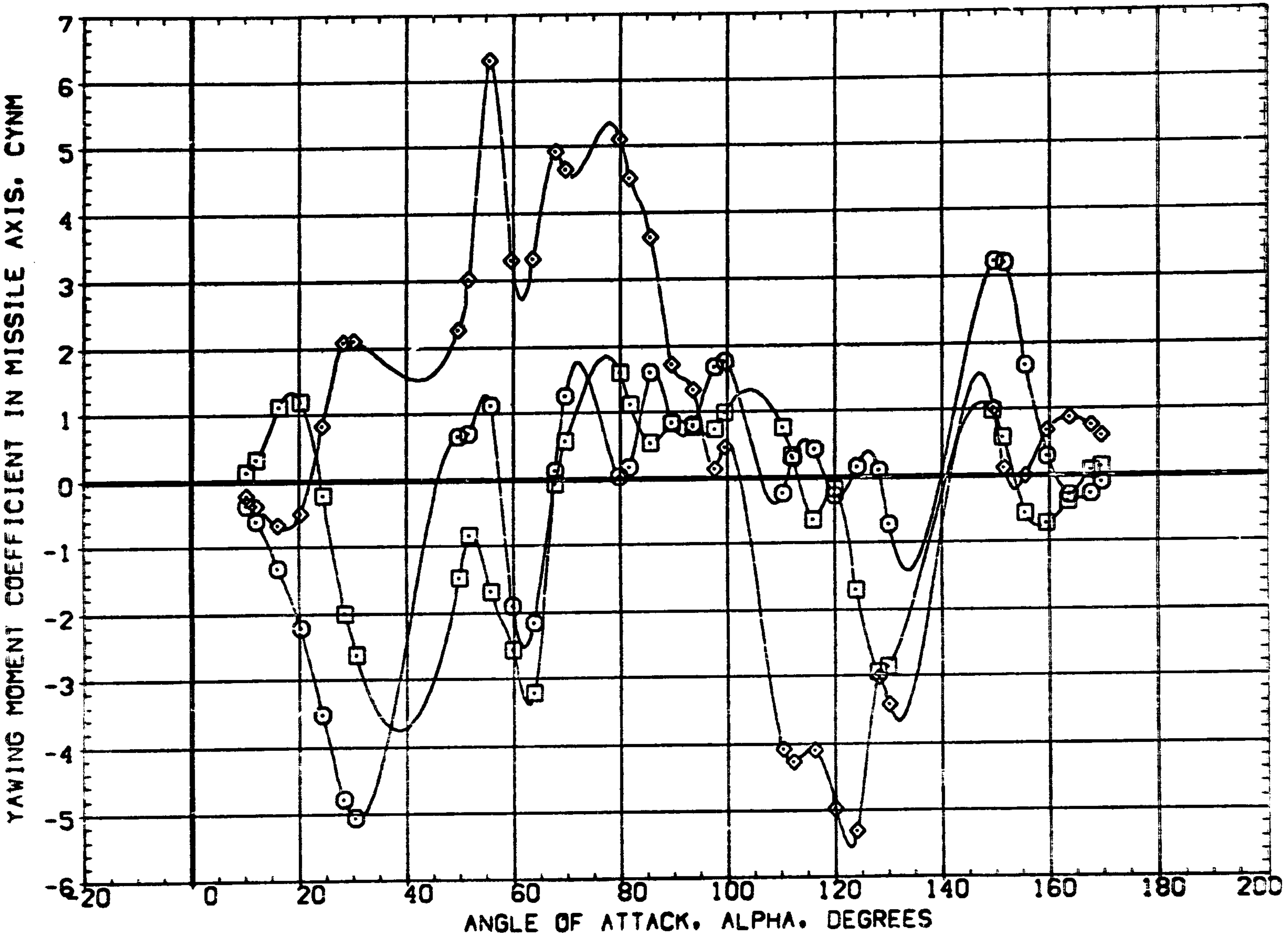


AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

[E]MACH = 3.48

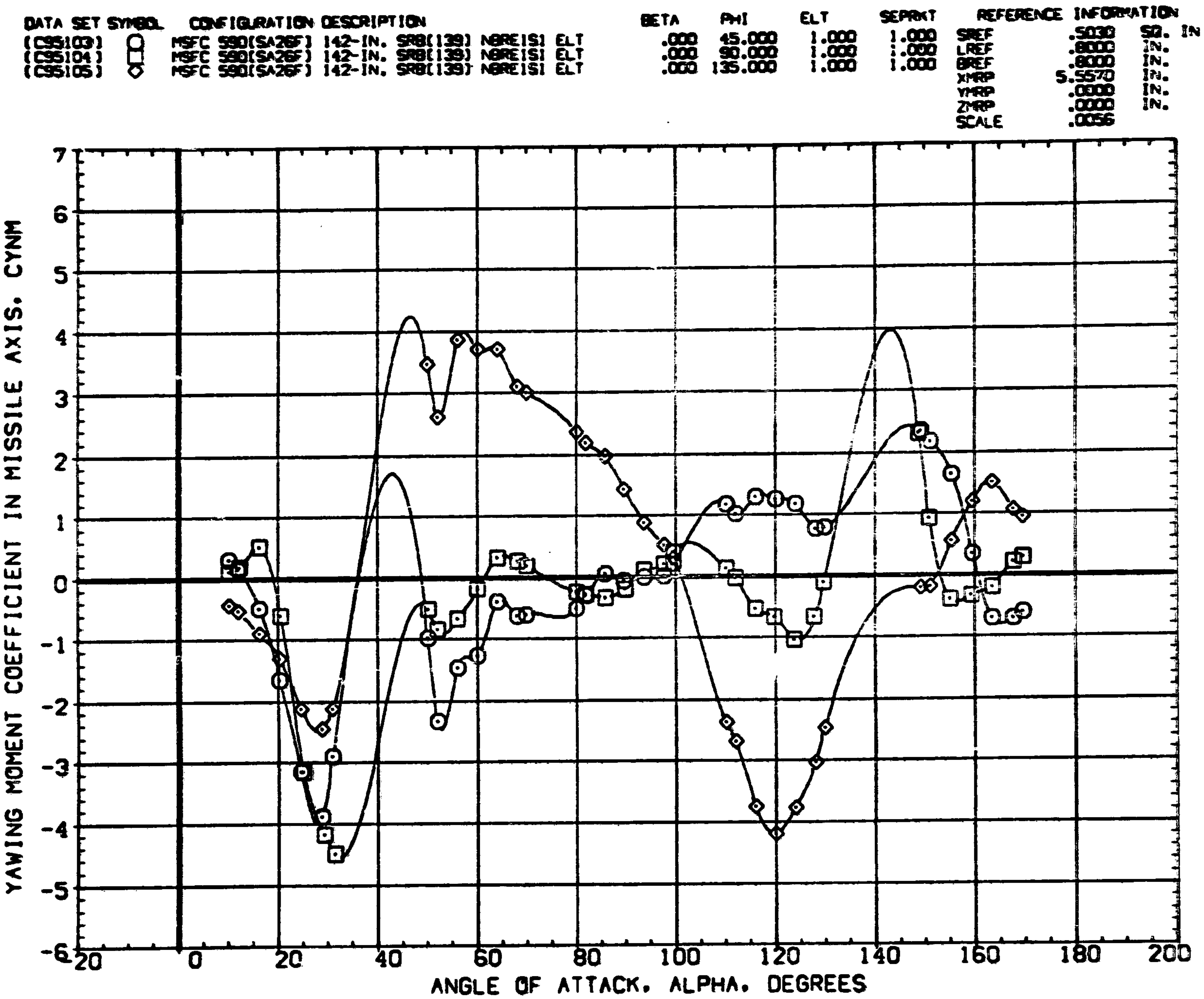
DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRKT
[C95103]	○	MSFC 590[SA26F] 142-IN. SRB[139] NBRE[S] ELT	.000	45.000	1.000	1.000
[C95104]	□	MSFC 590[SA26F] 142-IN. SRB[139] NBRE[S] ELT	.000	90.000	1.000	1.000
[C95105]	◇	MSFC 590[SA26F] 142-IN. SRB[139] NBRE[S] ELT	.000	135.000	1.000	1.000

REFERENCE INFORMATION		
SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	



AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

(A)MACH = .60

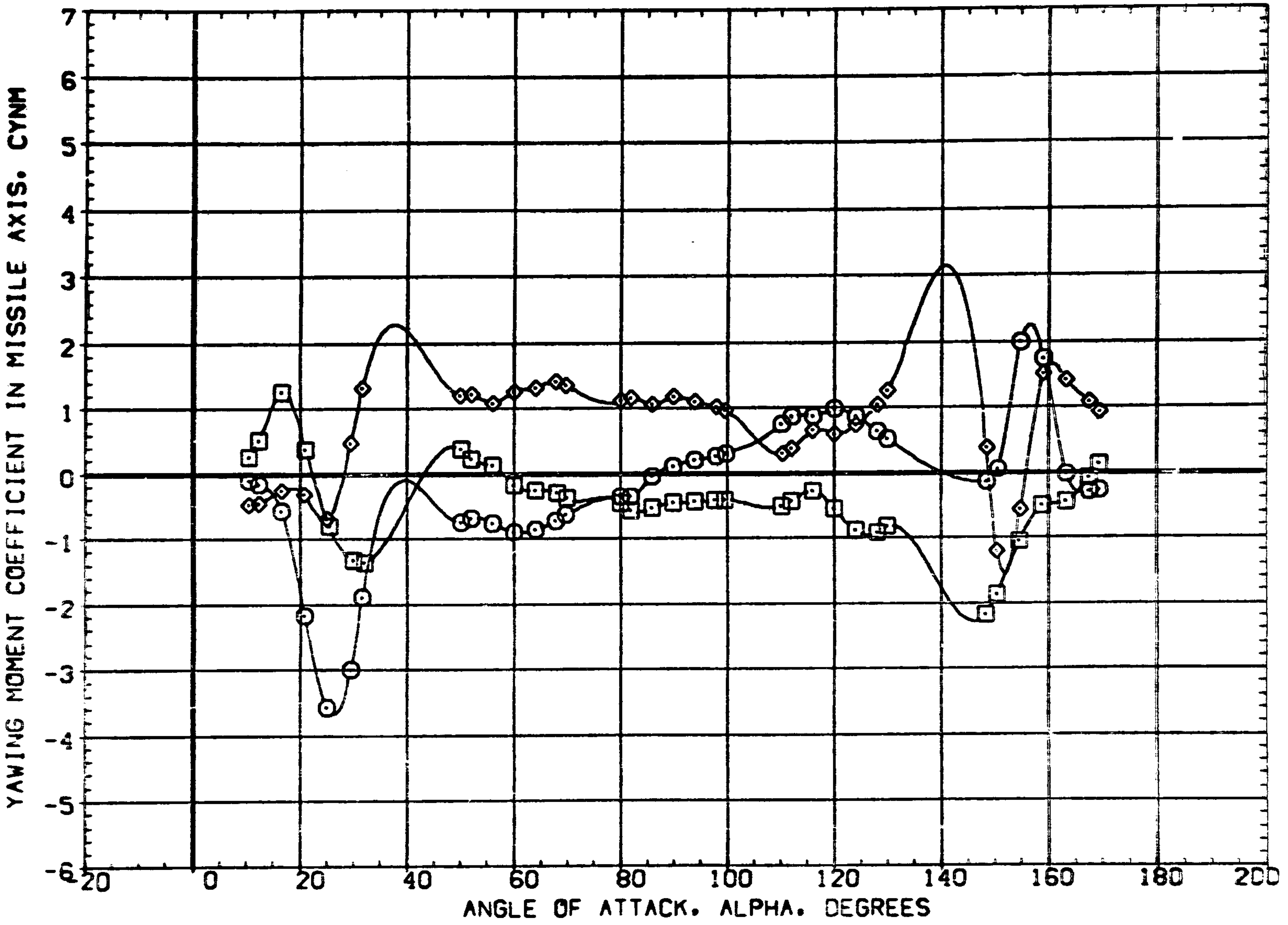


AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

(B)MACH = .90

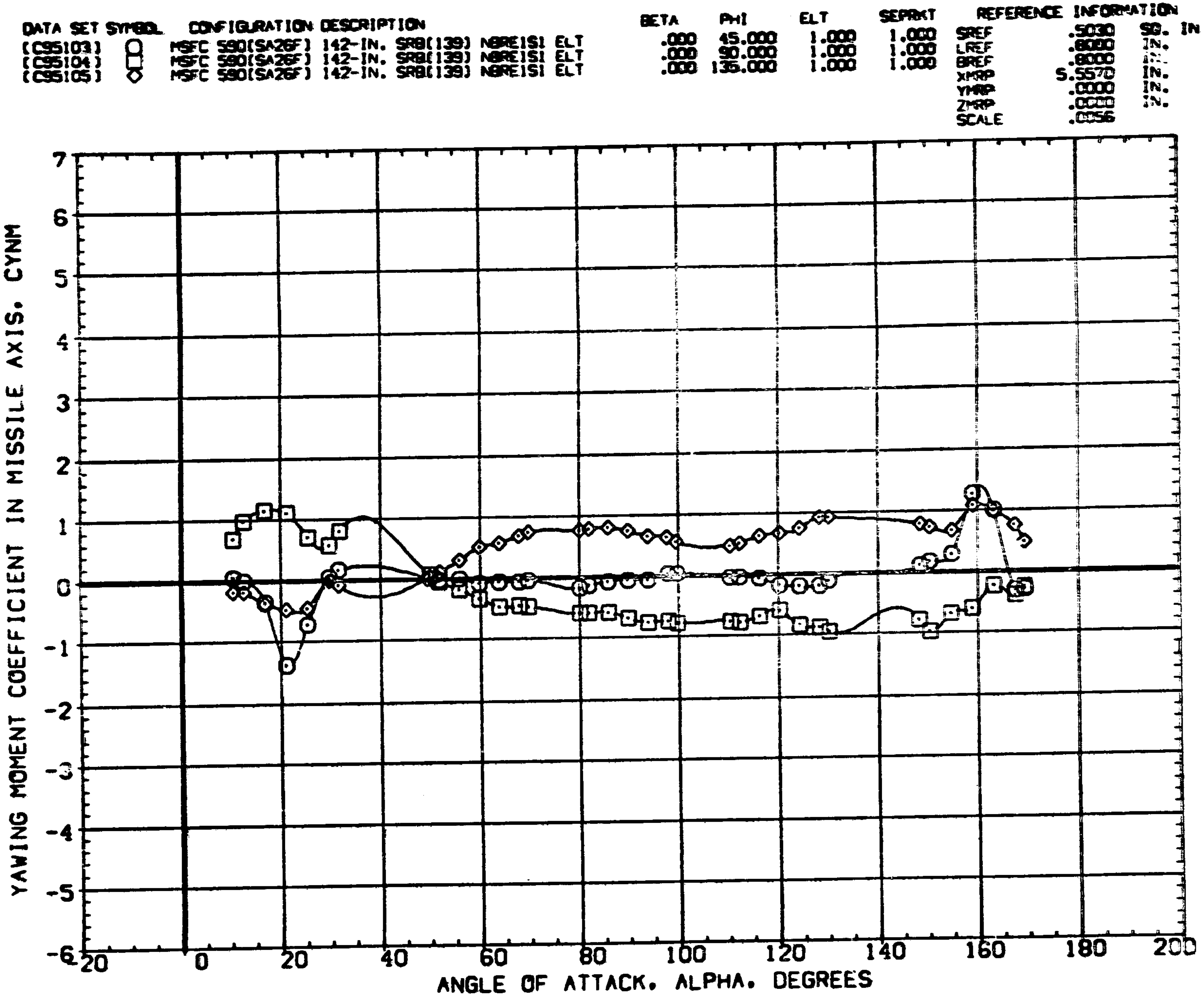
DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRNT
(C95103)	○	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	45.000	1.000	1.000
(C95104)	□	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	90.000	1.000	1.000
(C95105)	◇	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	135.000	1.000	1.000

REFERENCE	INFORMATION	
SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	



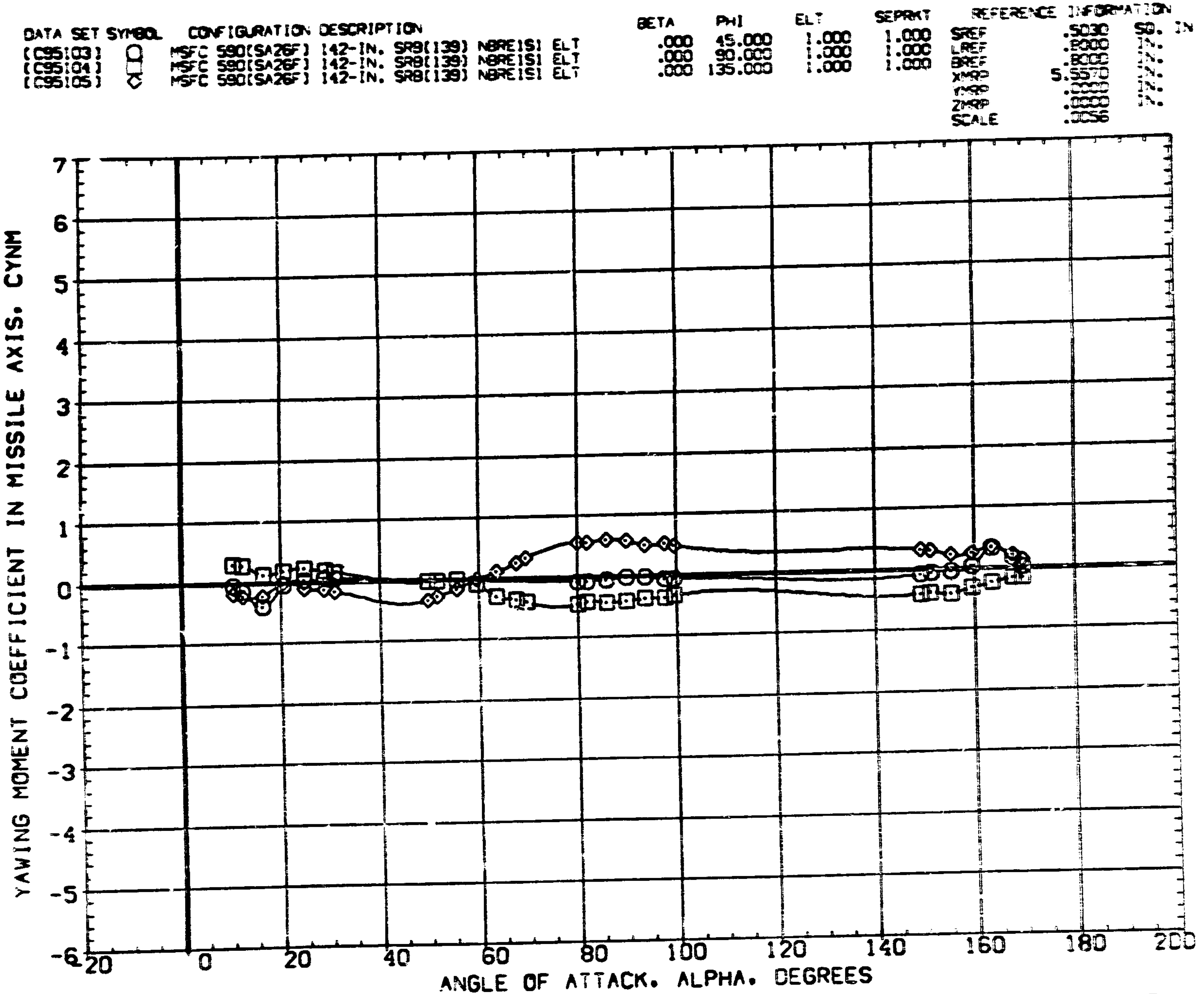
AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

(C)MACH = 1.20



AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

(D)MACH = 1.96

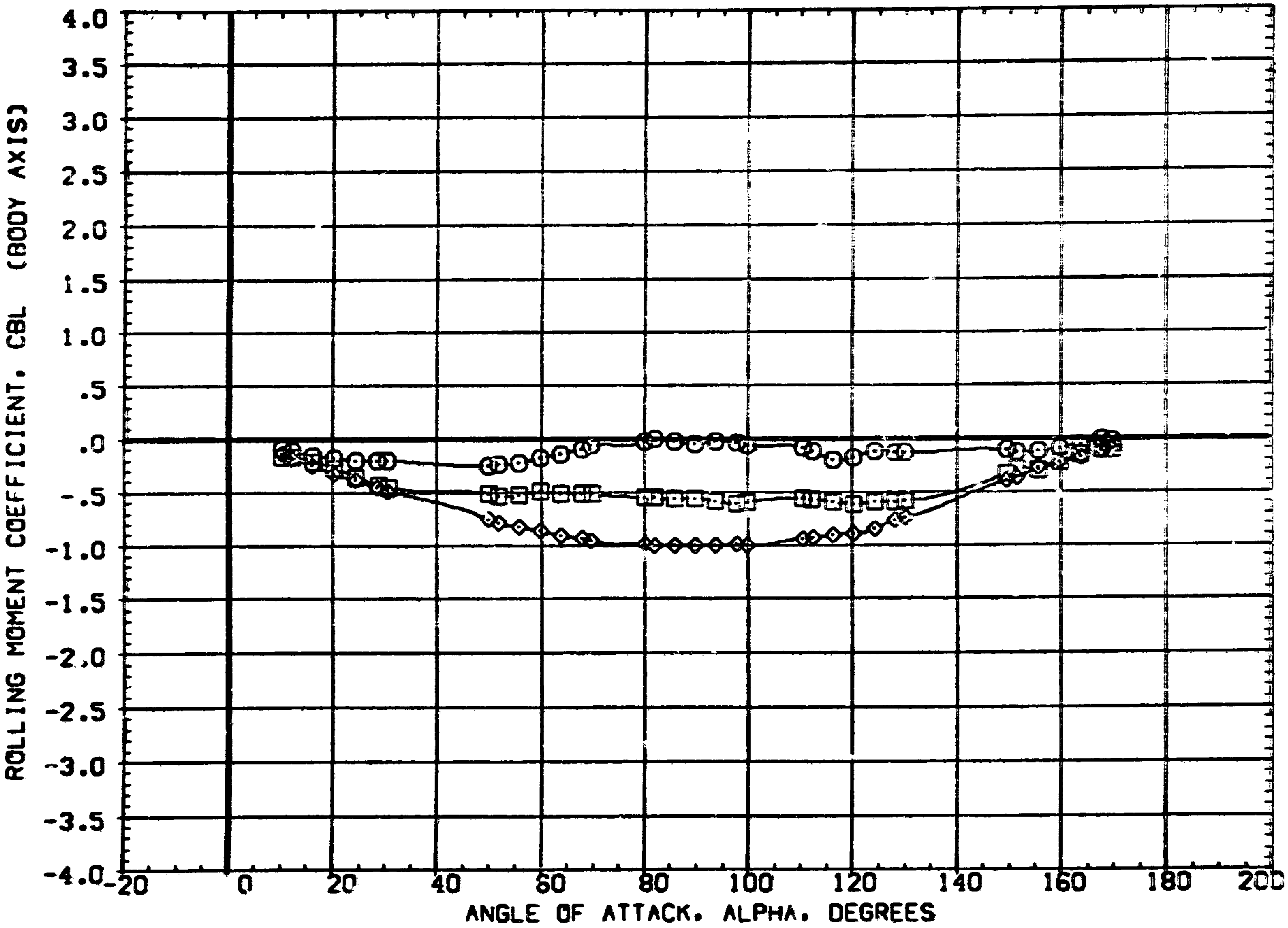


AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

(E)MACH = 3.48

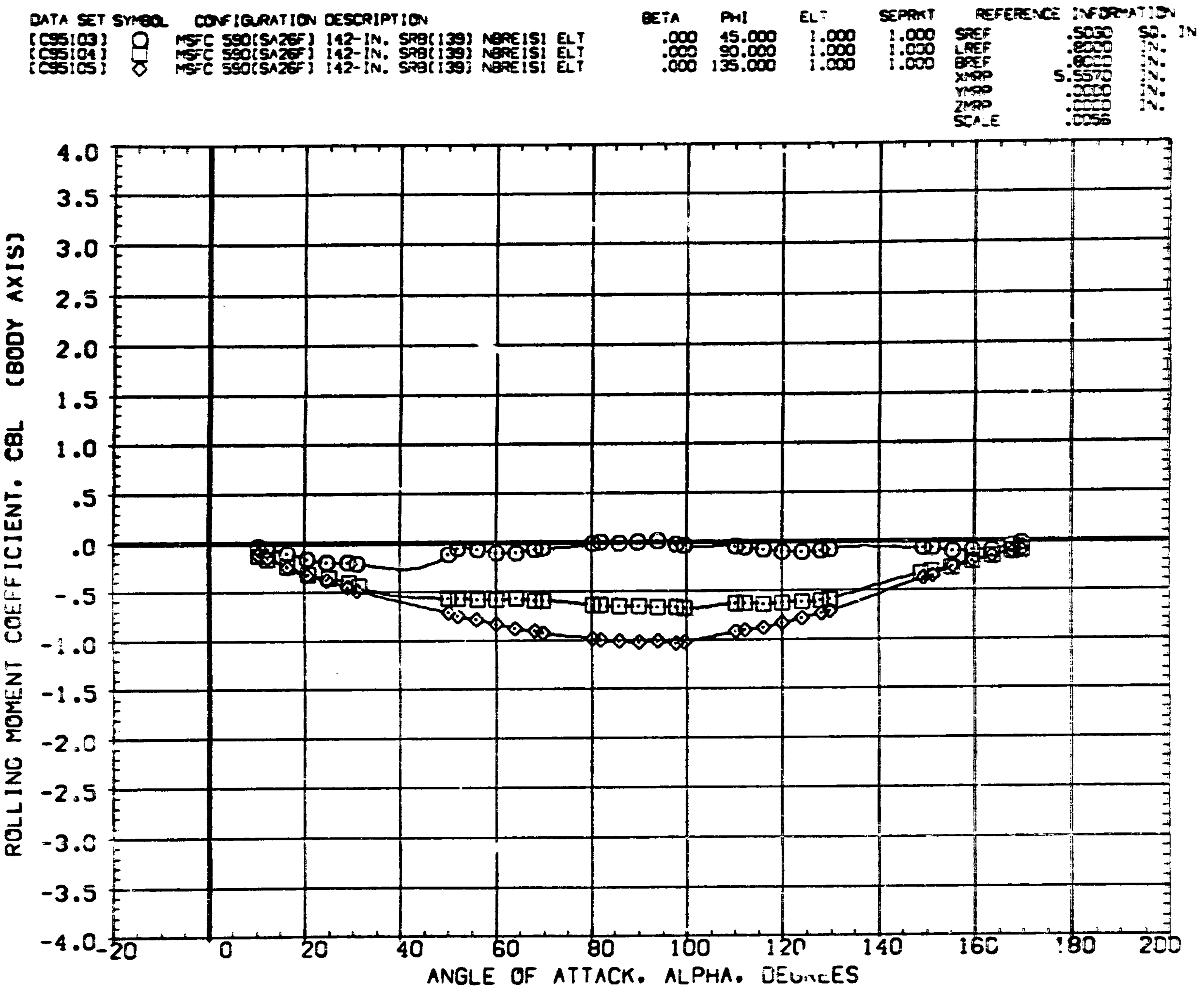
DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRKT
(C95103)	○	MSFC 580(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	45.000	1.000	1.000
(C95104)	□	MSFC 580(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	90.000	1.000	1.00C
(C95105)	◇	MSFC 580(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	135.000	1.000	1.000

REFERENCE INFORMATION		
SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	



AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

(A)MACH = .60

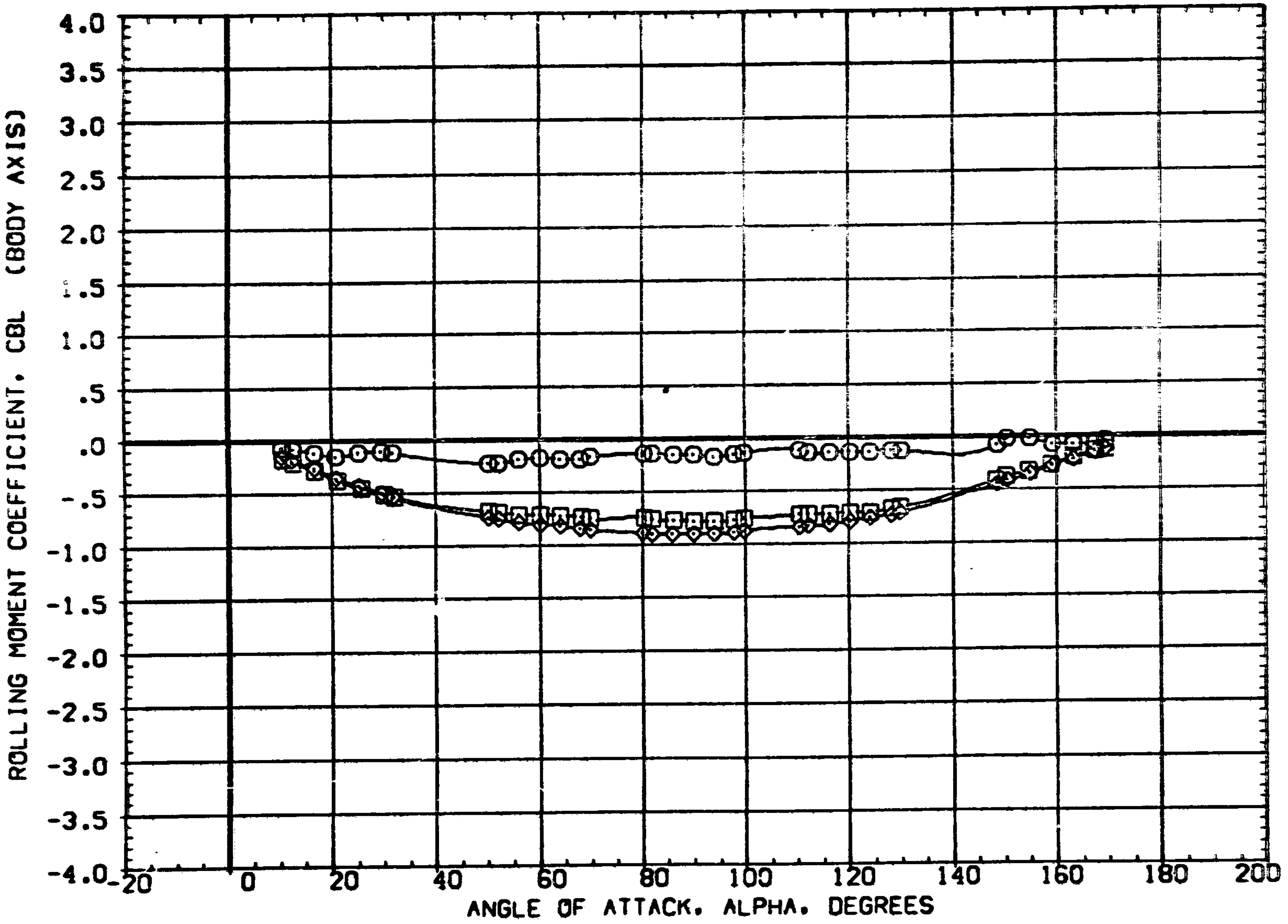


AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

(B)MACH = .90

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRKT
(C95103)	○	MSFC S90(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	45.000	1.000	1.000
(C95104)	□	MSFC S90(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	90.000	1.000	1.000
(C95105)	◇	MSFC S90(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	135.000	1.000	1.000

REFERENCE INFORMATION		
SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	

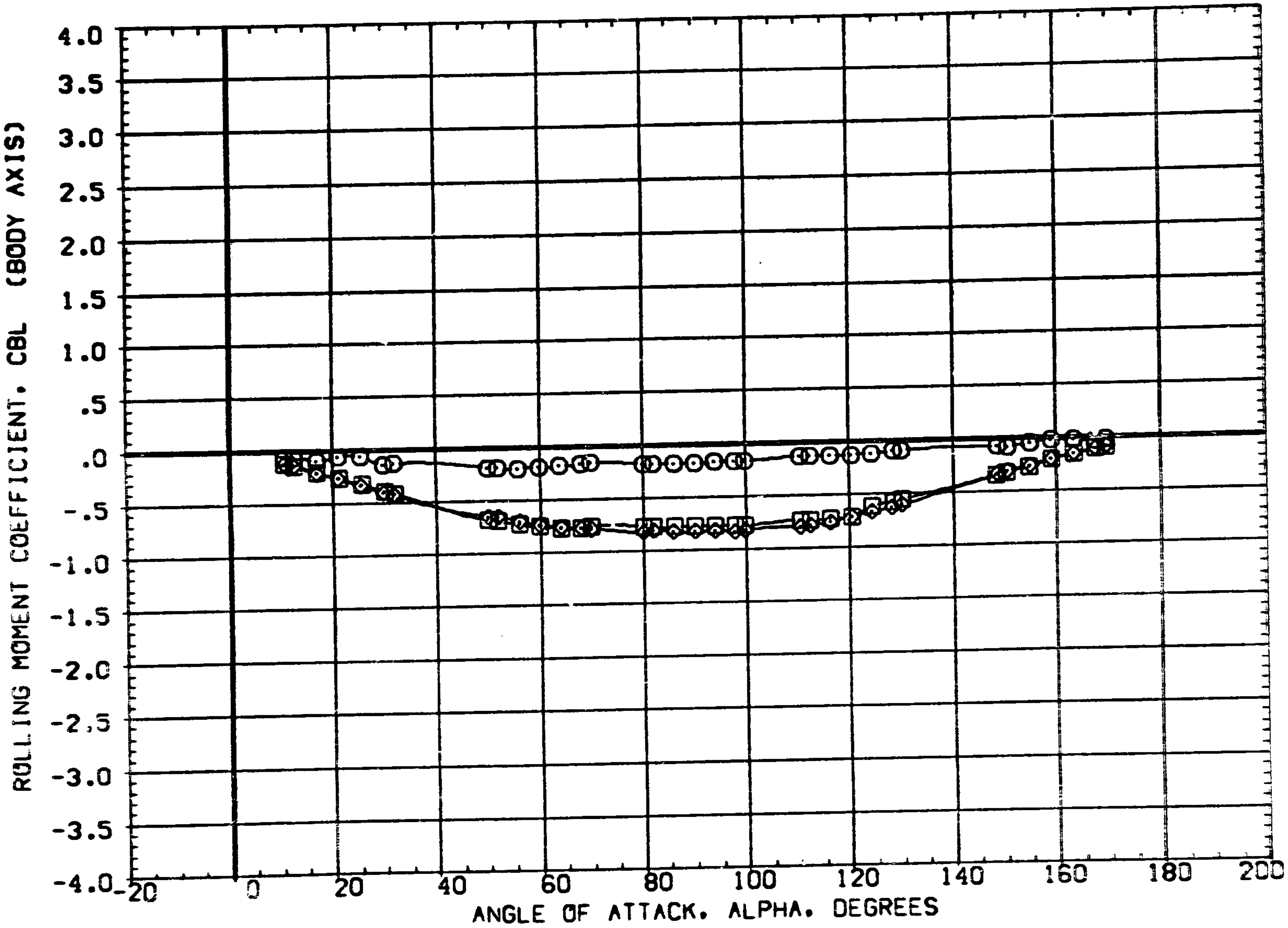


AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

(C)MACH = 1.20

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRKT
[C95103]	○	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	45.000	1.000	1.000
[C95104]	□	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	90.000	1.000	1.000
[C95105]	◇	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	135.000	1.000	1.000

REFERENCE	INFORMATION	
SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	

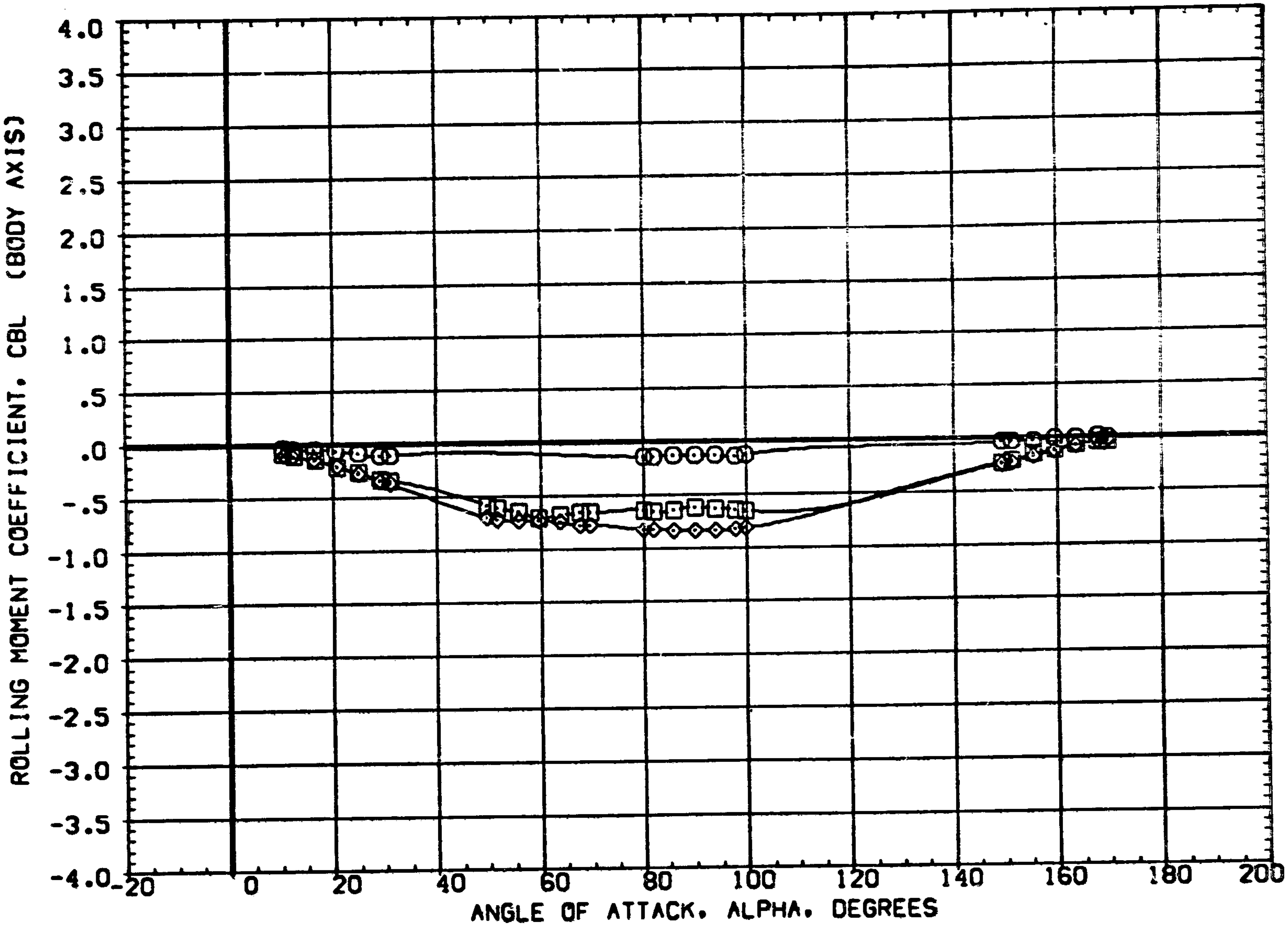


AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

(D)MACH = 1.96

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRKT
(C95103)	○	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	45.000	1.000	1.000
(C95104)	□	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	90.000	1.000	1.000
(C95105)	◇	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	135.000	1.000	1.000

REFERENCE INFORMATION		
SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	

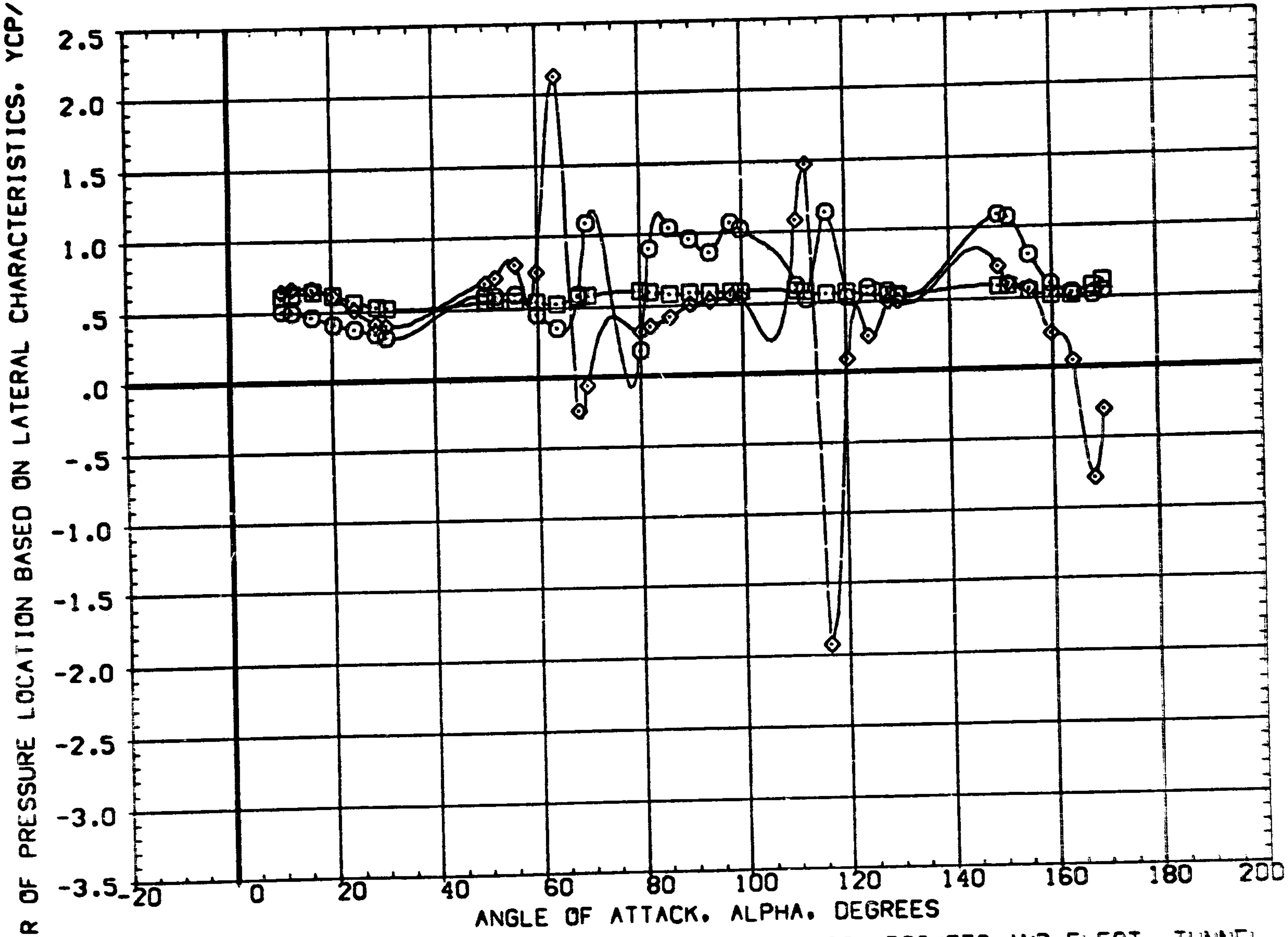


AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

(E)MACH = 3.48

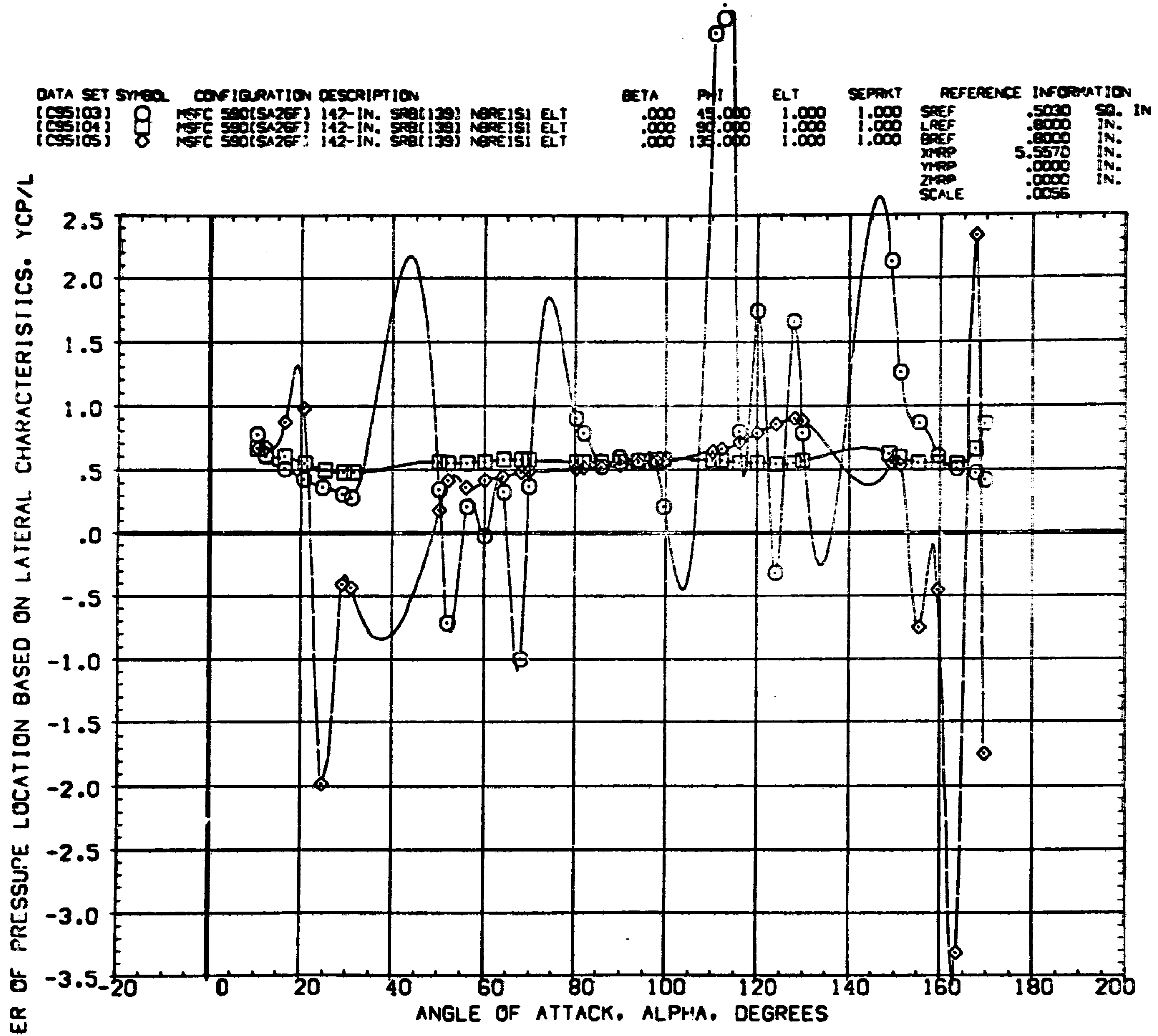
DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRKT
(C95103)	○	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	45.000	1.000	1.000
(C95104)	□	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	90.000	1.000	1.000
(C95105)	◇	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	135.000	1.000	1.000

REFERENCE INFORMATION		
SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	



AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

(A)MACH = .60



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRKT
(C95103)	○	MSFC 580(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	45.000	1.000	1.000
(C95104)	□	MSFC 580(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	90.000	1.000	1.000
(C95105)	◇	MSFC 580(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	135.000	1.000	1.000

REFERENCE INFORMATION		
SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	

CENTER OF PRESSURE LOCATION BASED ON LATERAL CHARACTERISTICS, YCP/L
2.5
2.0
1.5
1.0
.5
.0
-.5
-1.0
-1.5
-2.0
-2.5
-3.0
-3.5
-20
0
20
40
60
80
100
120
140
160
180
200
ANGLE OF ATTACK, ALPHA, DEGREES

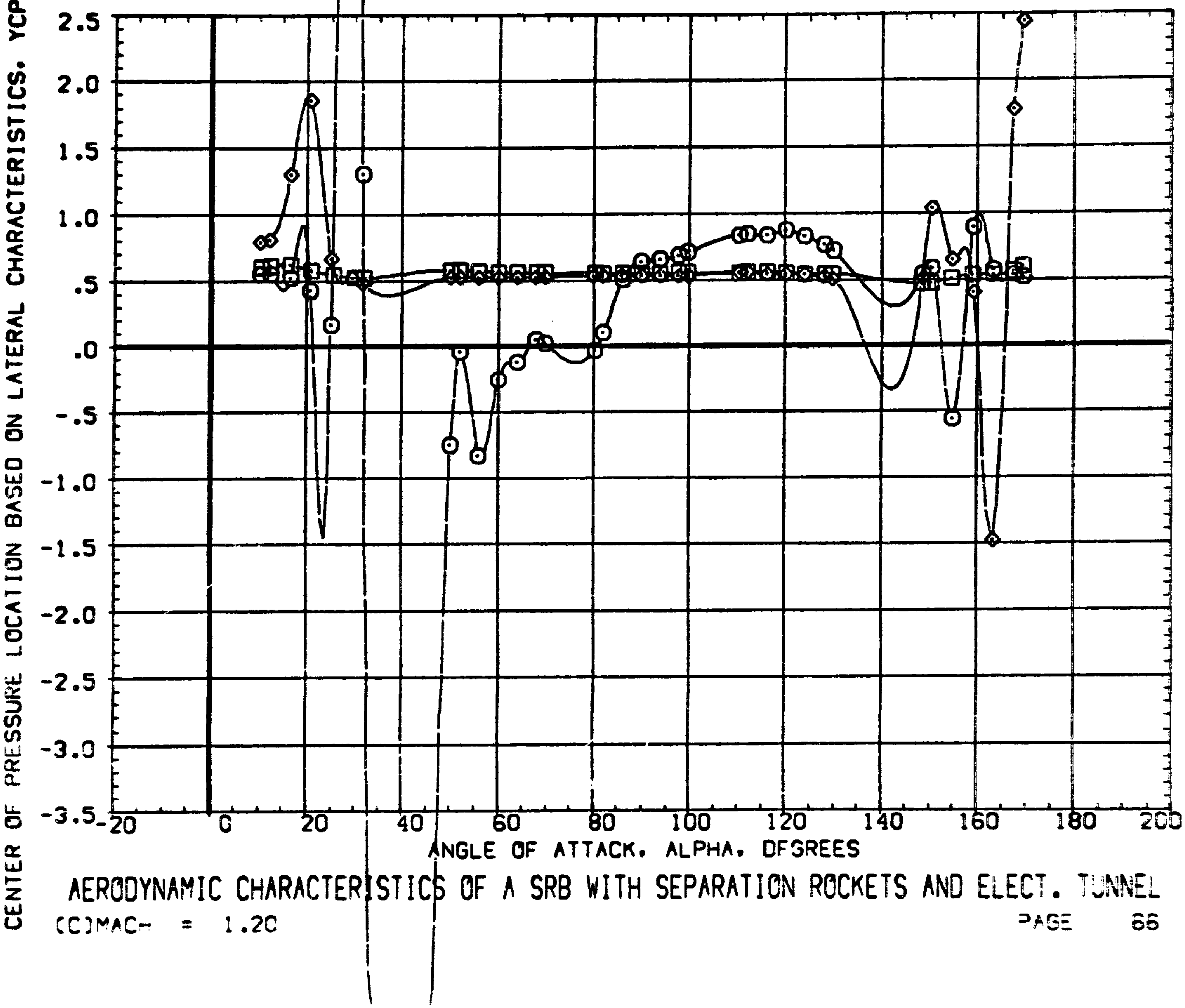
AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

(B)MACH = .90

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRKT
(C95103)	○	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	45.000	1.000	1.000
(C95104)	□	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	90.000	1.000	1.000
(C95105)	◇	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S) ELT	.000	135.000	1.000	1.000

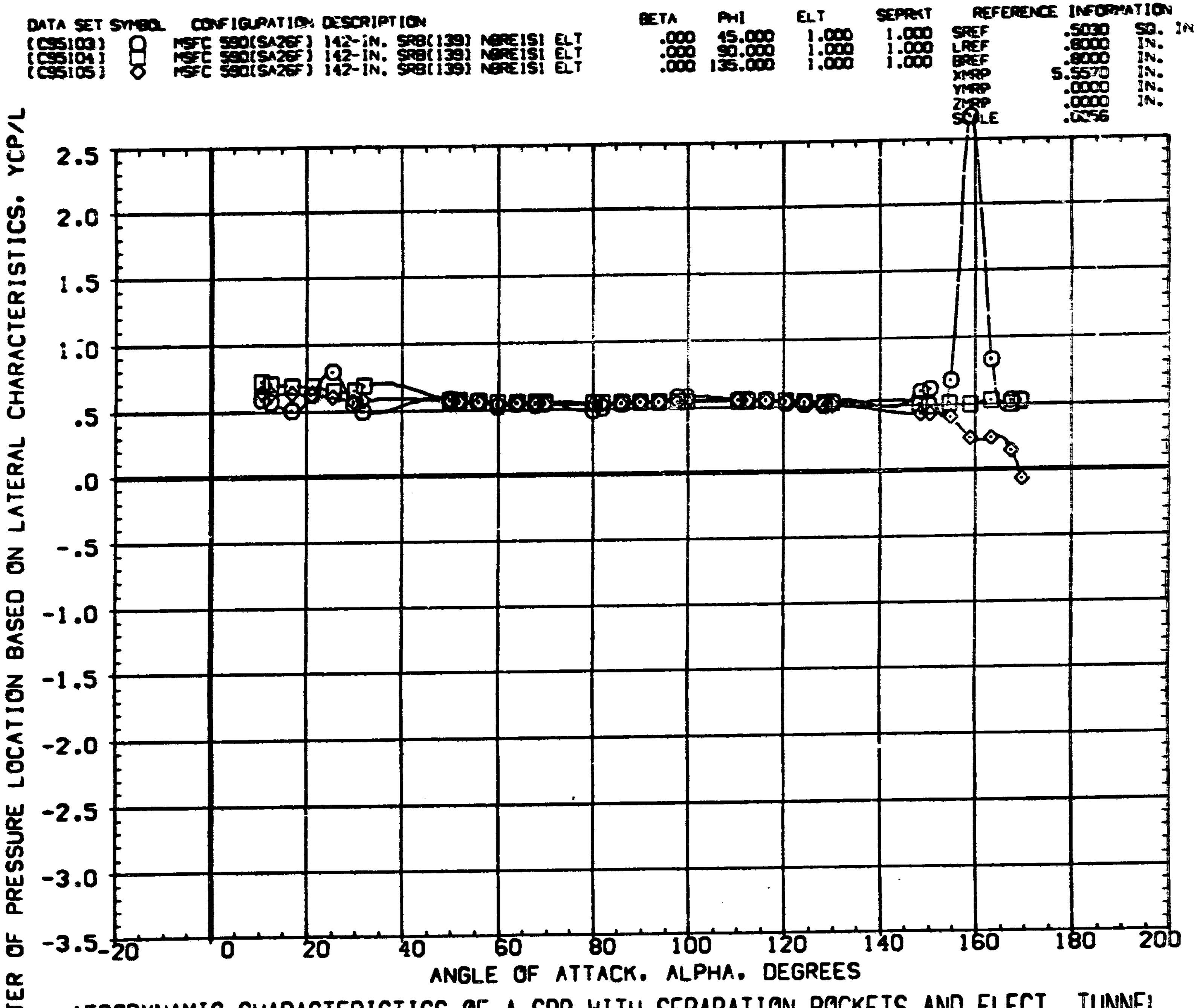
REFERENCE INFORMATION

SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	



AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

(C)MACH = 1.20

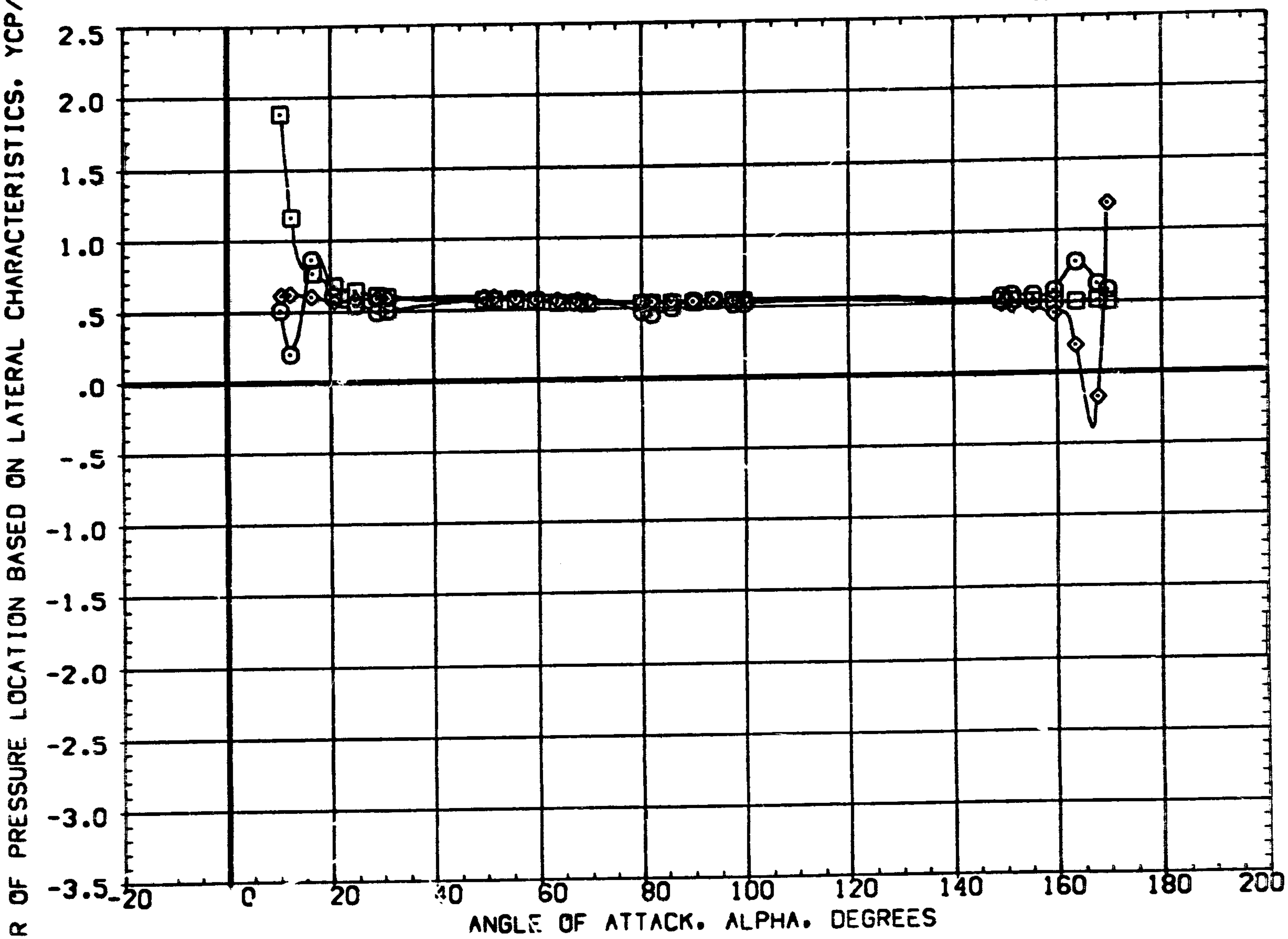


AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

(D)MACH = 1.96

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRKT
[C95103]	□	MSFC 590[SA26F] 142-IN. SRB[139] NBRE[S] ELT	.000	45.000	1.000	1.000
[C95104]	○	MSFC 590[SA26F] 142-IN. SRB[139] NBRE[S] ELT	.000	90.000	1.000	1.000
[C95105]	◇	MSFC 590[SA26F] 142-IN. SRB[139] NBRE[S] ELT	.000	135.000	1.000	1.000

REFERENCE INFORMATION		
SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	

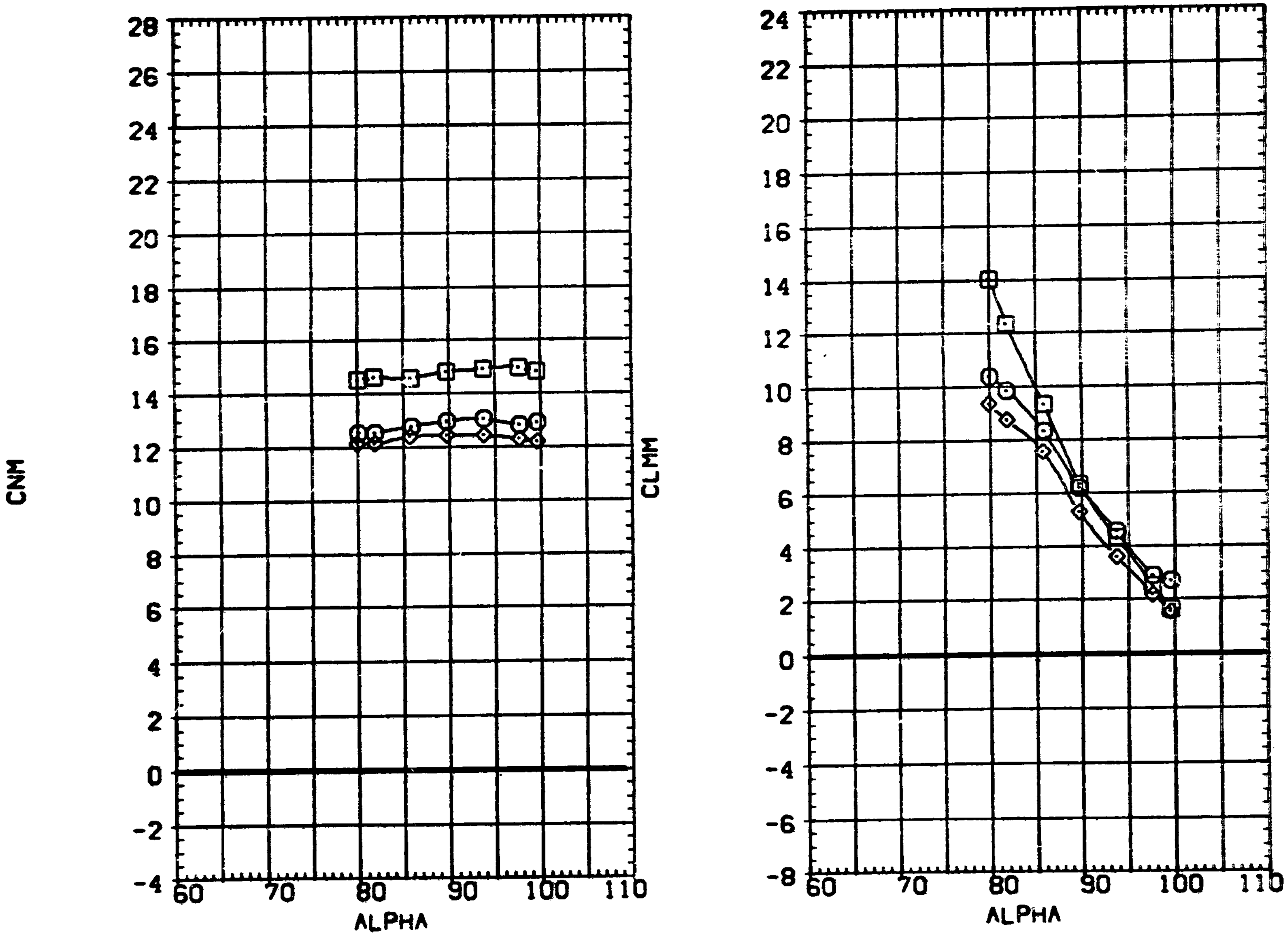


AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

(E)MACH = 3.48

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRKT
(C95027)	○	MSFC 590(SA26F) 142-IN. SRB(139) NBRE1S2 ELT	.000	45.000	1.000	2.000
(C95028)	□	MSFC 590(SA26F) 142-IN. SRB(139) NBRE1S2 ELT	.000	90.000	1.000	2.000
(C95029)	◇	MSFC 590(SA26F) 142-IN. SRB(139) NBRE1S2 ELT	.000	135.000	1.000	2.000

REFERENCE INFORMATION		
SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	

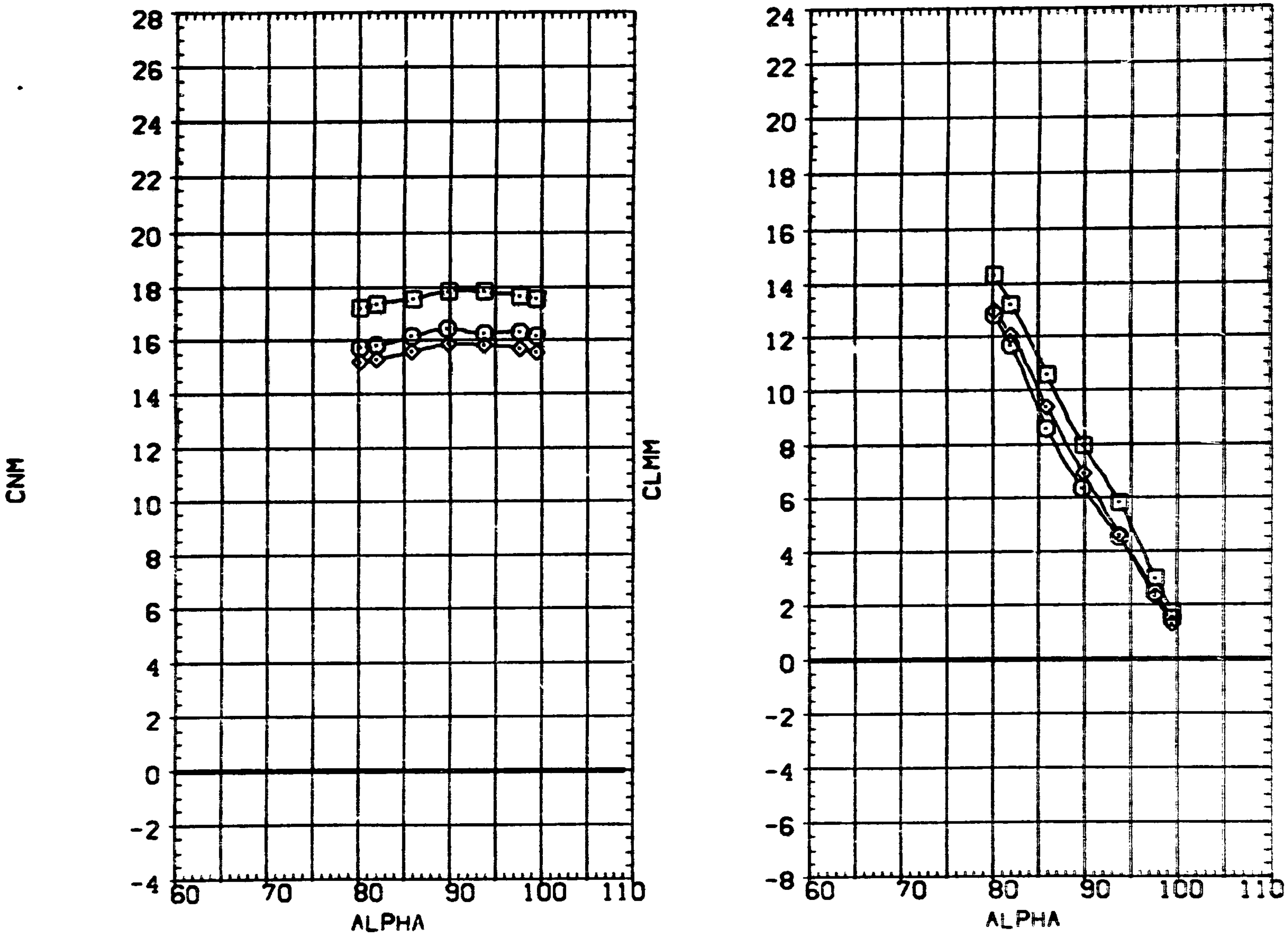


AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

(A)MACH = .60

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRKT
(C95027)	○	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S2 ELT	.000	45.000	1.000	2.000
(C95028)	□	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S2 ELT	.000	90.000	1.000	2.000
(C95029)	◇	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S2 ELT	.000	135.000	1.000	2.000

REFERENCE INFORMATION		
SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	

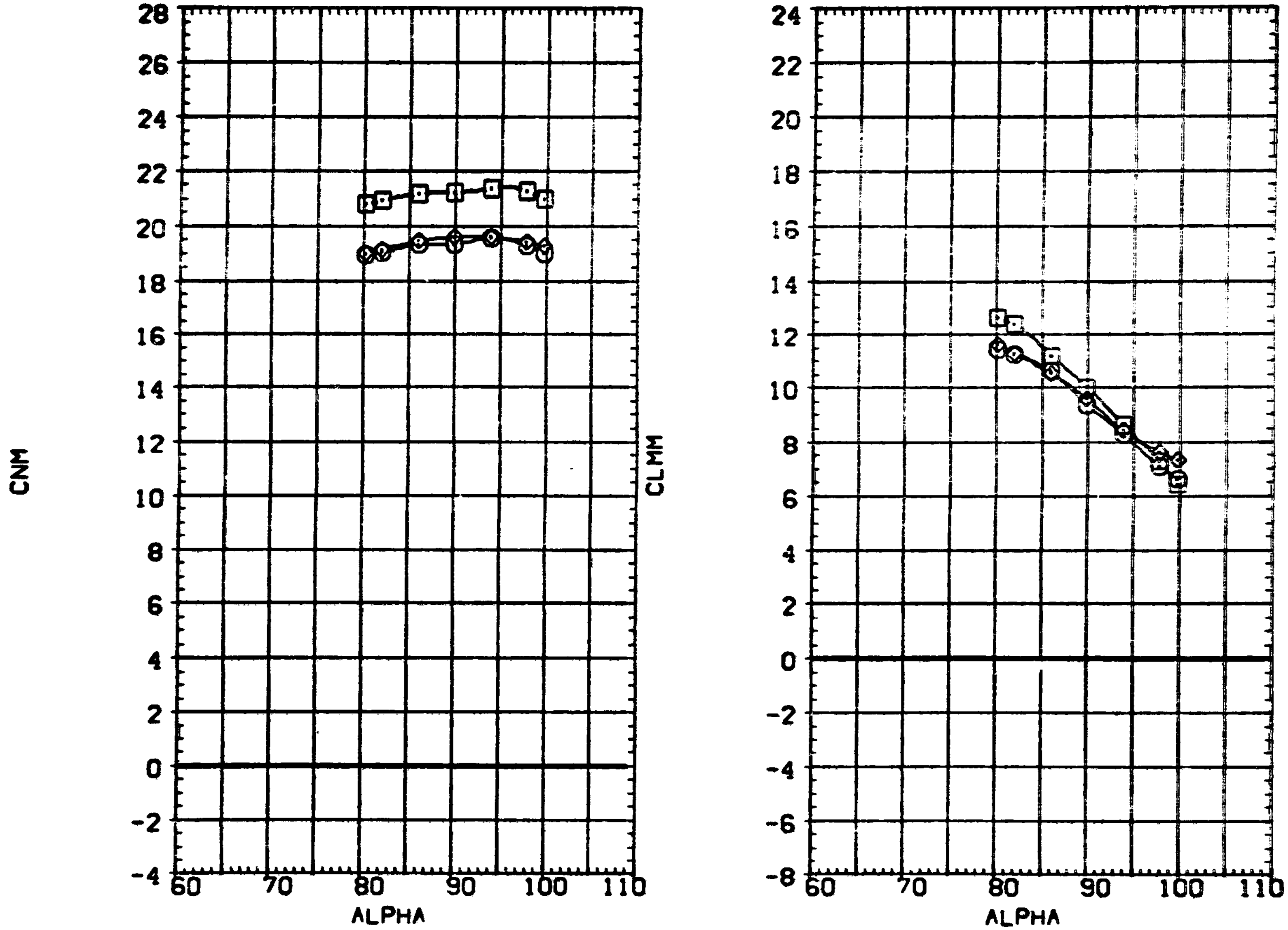


AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

(B)MACH = .90

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRKT
(C95027)	○	MSFC 590(SA26F) 142-IN. SRB(139) NBRE1S2 ELT	.000	45.000	1.000	2.000
(C95028)	□	MSFC 590(SA26F) 142-IN. SRB(139) NBRE1S2 ELT	.000	90.000	1.000	2.000
(C95029)	◇	MSFC 590(SA26F) 142-IN. SRB(139) NBRE1S2 ELT	.000	135.000	1.000	2.000

REFERENCE INFORMATION		
SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	

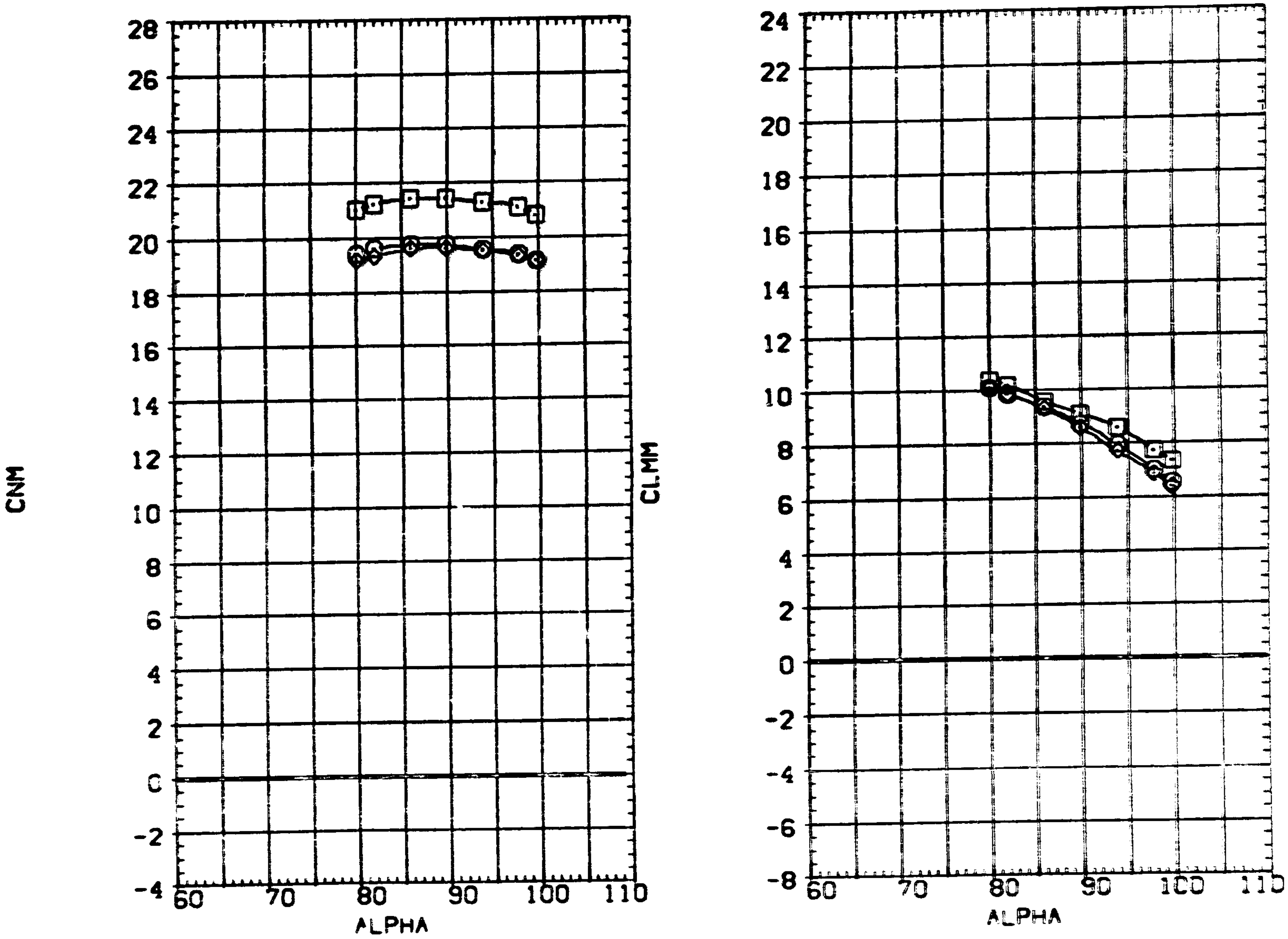


AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

(C)MAC- = 1.20

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRKT
(C95027)	○	MSFC 590(SA26F) 142-IN. SRB(139) NBRE:S2 ELT	.000	45.000	1.000	2.000
(C95028)	□	MSFC 590(SA26F) 142-IN. SRB(139) NBRE:S2 ELT	.000	90.000	1.000	2.000
(C95029)	◇	MSFC 590(SA26F) 142-IN. SRB(139) NBRE:S2 ELT	.000	135.000	1.000	2.000

REFERENCE INFORMATION		
SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	

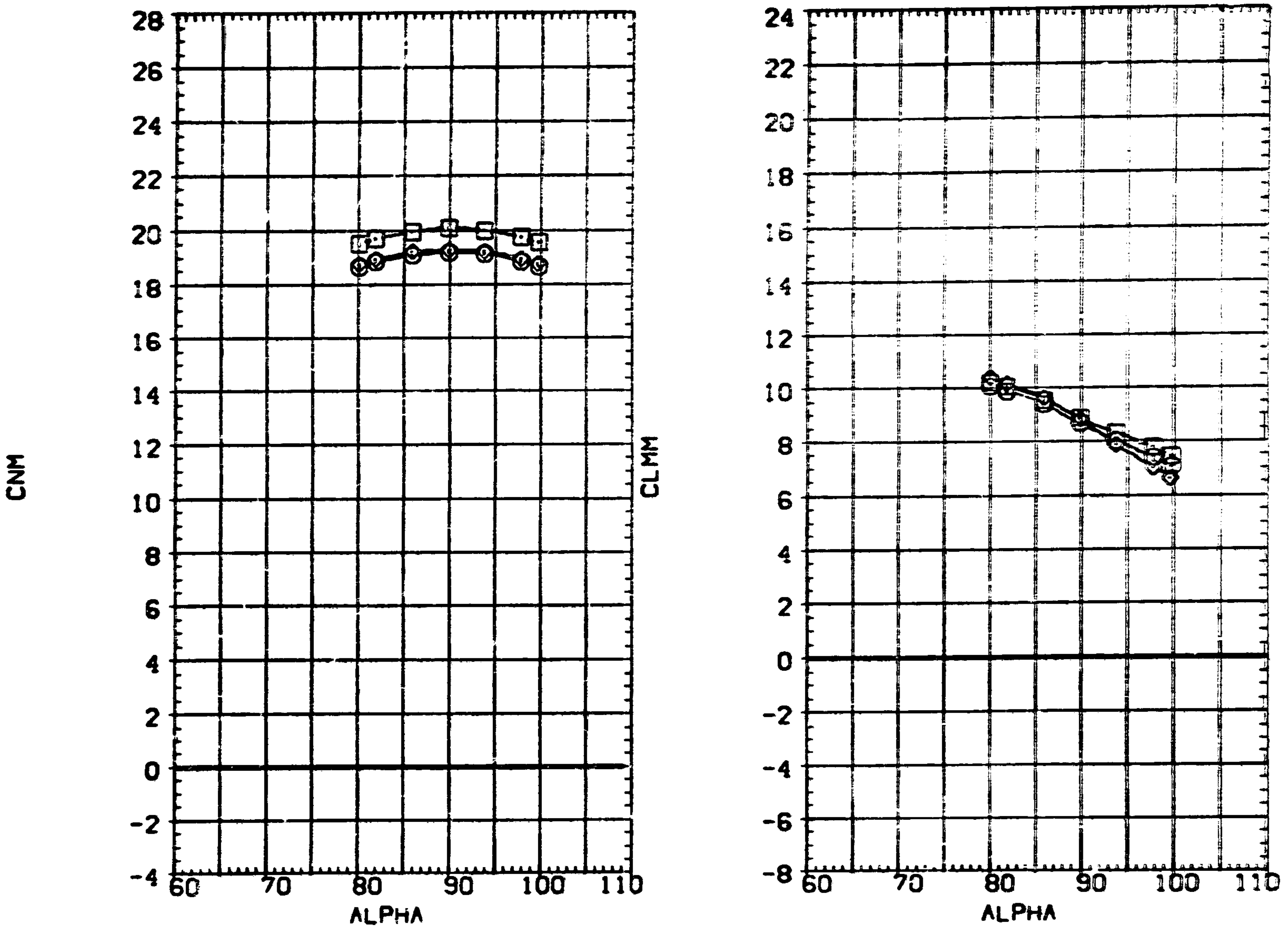


AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

(D)MACH = 1.96

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRKT
(C95027)	○	MSFC SSO(SA26F) 142-IN. SRB(139) NBREIS2 ELT	.000	45.000	1.000	2.000
(C95028)	□	MSFC SSO(SA26F) 142-IN. SRB(139) NBREIS2 ELT	.000	90.000	1.000	2.000
(C95029)	◇	MSFC SSO(SA26F) 142-IN. SRB(139) NBREIS2 ELT	.000	135.000	1.000	2.000

REFERENCE INFORMATION		
SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	



AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

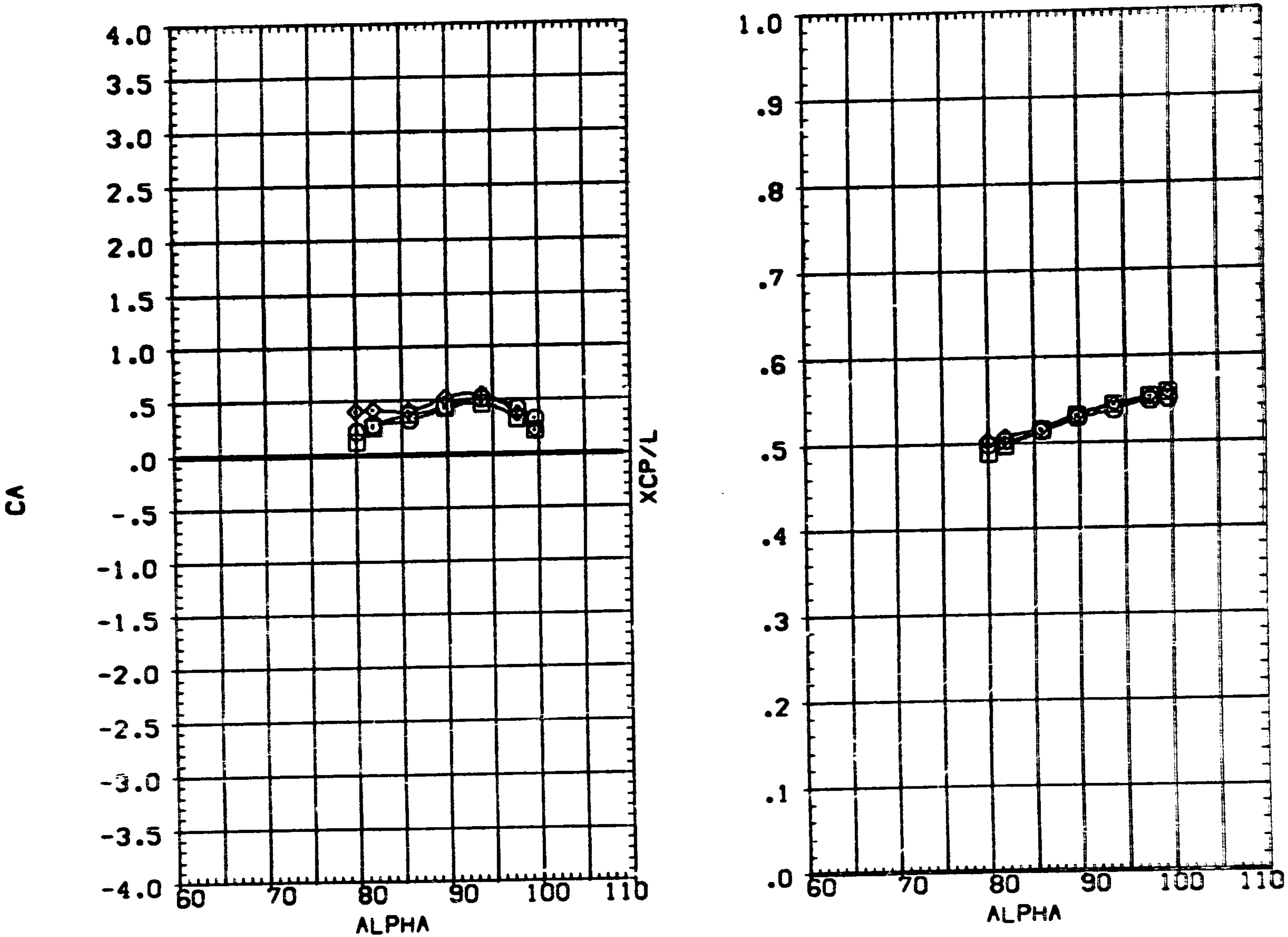
(E)MACH = 3.48

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
[C95027]	○	MSFC 590(SA26F) 142-IN. SRB(139) N3RE1S2 ELT
[C95028]	□	MSFC 590(SA26F) 142-IN. SRB(139) N3RE1S2 ELT
[C95029]	◇	MSFC 590(SA26F) 142-IN. SRB(139) N3RE1S2 ELT

BETA	PHI	ELT	SEPRKT
.000	45.000	1.000	2.000
.000	90.000	1.000	2.000
.000	135.000	1.000	2.000

REFERENCE INFORMATION

SREF	.5030	SQ. IN.
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5580	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	



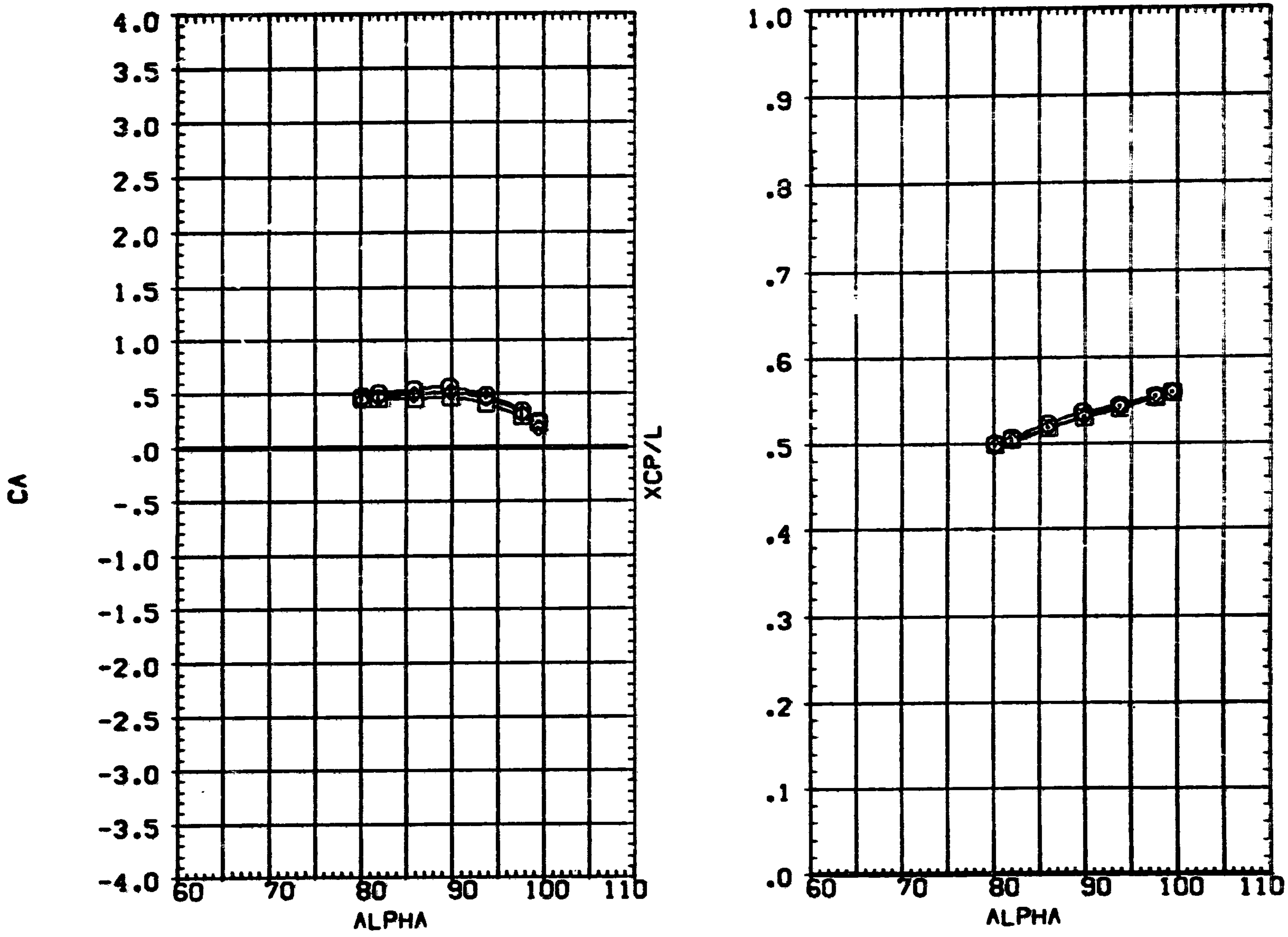
AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

(A)MACH = .60

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRKT
(C95027)	○	MSFC 590(SA26F) 142-IN. SRB(139) NBRE1S2 ELT	.000	45.000	1.000	2.000
(C95024)	□	MSFC 590(SA26F) 142-IN. SRB(139) NBRE1S2 ELT	.000	90.000	1.000	2.000
(C95025)	◇	MSFC 590(SA26F) 142-IN. SRB(139) NBRE1S2 ELT	.000	135.000	1.000	2.000

REFERENCE INFORMATION

SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	



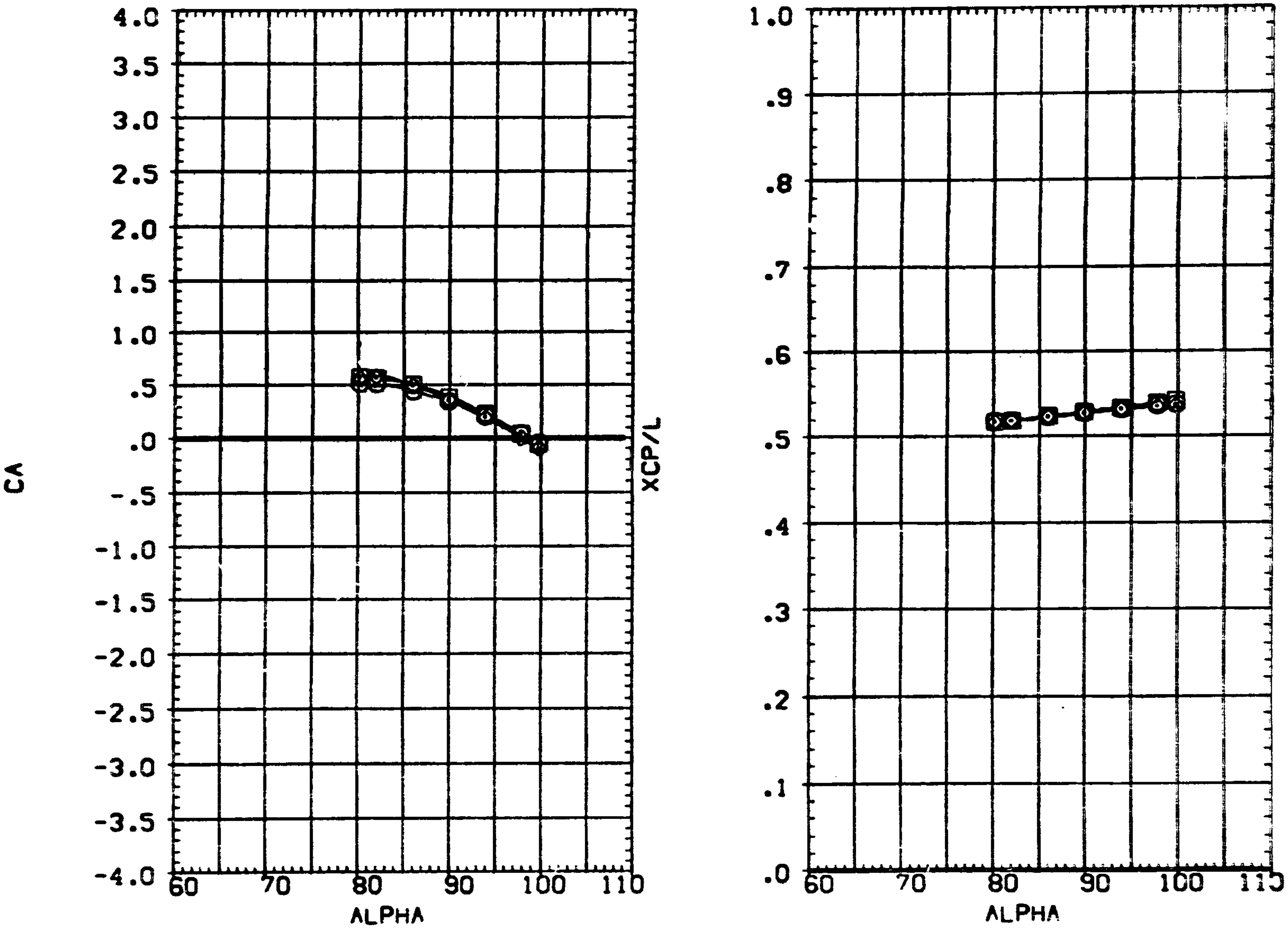
AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

(B)MAC- = .90

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRKT
[C95027]	○	MSFC 590(SA26F) 142-IN. SRB(139) NBREIS2 ELT	.000	45.000	1.000	2.000
[C95028]	□	MSFC 590(SA26F) 142-IN. SRB(139) NBREIS2 ELT	.000	90.000	1.000	2.000
[C95029]	◇	MSFC 590(SA26F) 142-IN. SRB(139) NBREIS2 ELT	.000	135.000	1.000	2.000

REFERENCE INFORMATION

SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	

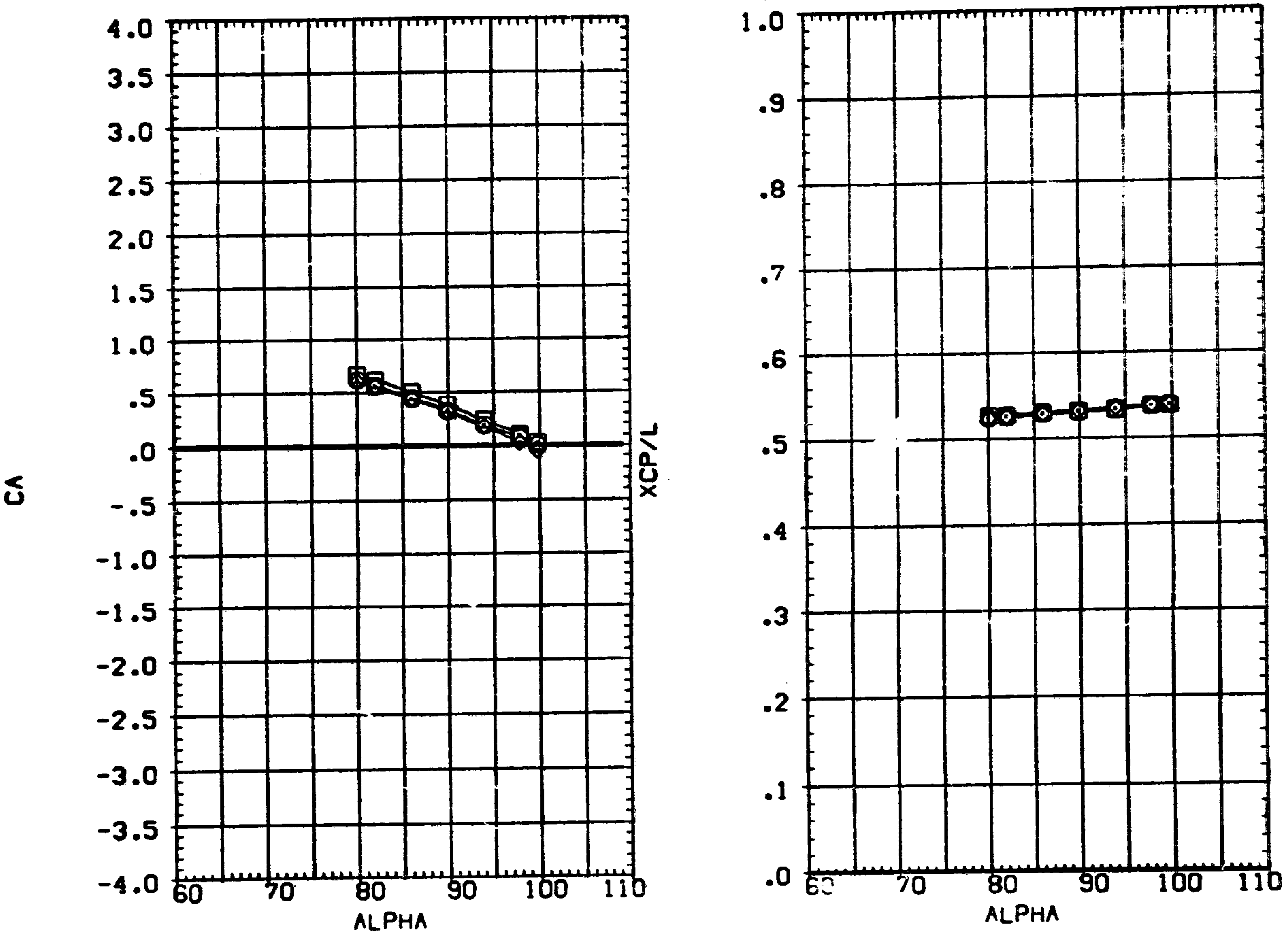


AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

(C)MACH = 1.20

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRKT
(C95027)	○	MSFC 590(SA26F) 142-IN. SRB(139) NBRE1S2 ELT	.000	45.000	1.000	2.000
(C95028)	□	MSFC 590(SA26F) 142-IN. SRB(139) NBRE1S2 ELT	.000	90.000	1.000	2.000
(C95029)	◇	MSFC 590(SA26F) 142-IN. SRB(139) NBRE1S2 ELT	.000	135.000	1.000	2.000

REFERENCE	INFORMATION	
SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	

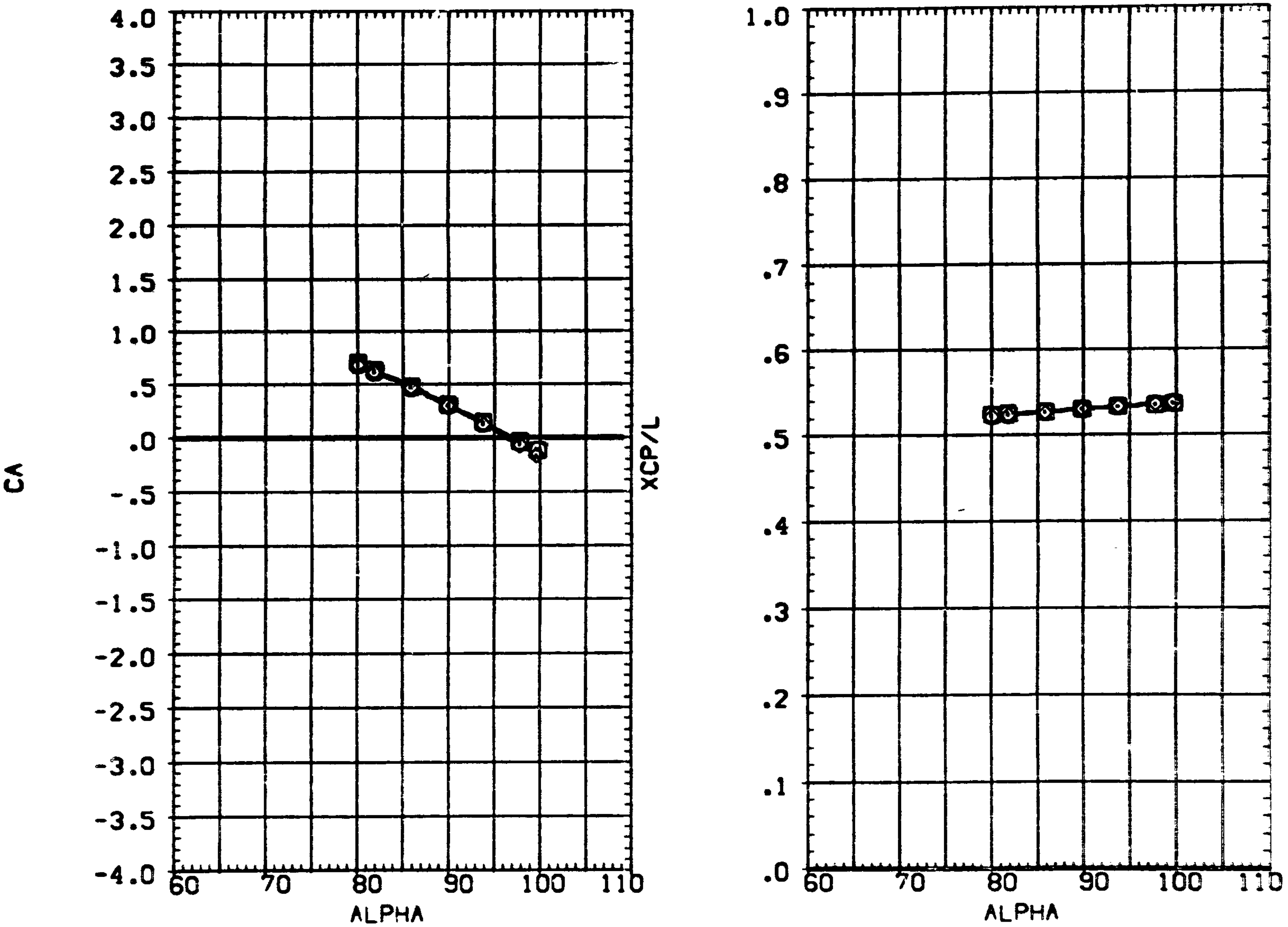


AERODYNAMIC CHARACTERISTICS OF A SRB WITH SE?ARA...ON ROCKETS AND ELECT. TUNNEL

(D)MACH = 1.96

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRKT
[C95027]	○	MSFC 590[SA26F] 142-IN. SRB[139] NBRE1S2 ELT	.000	45.000	1.000	2.000
[C95028]	□	MSFC 590[SA26F] 142-IN. SRB[139] NBRE1S2 ELT	.000	90.000	1.000	2.000
[C95029]	◇	MSFC 590[SA26F] 142-IN. SRB[139] NBRE1S2 ELT	.000	135.000	1.000	2.000

REFERENCE INFORMATION		
SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	



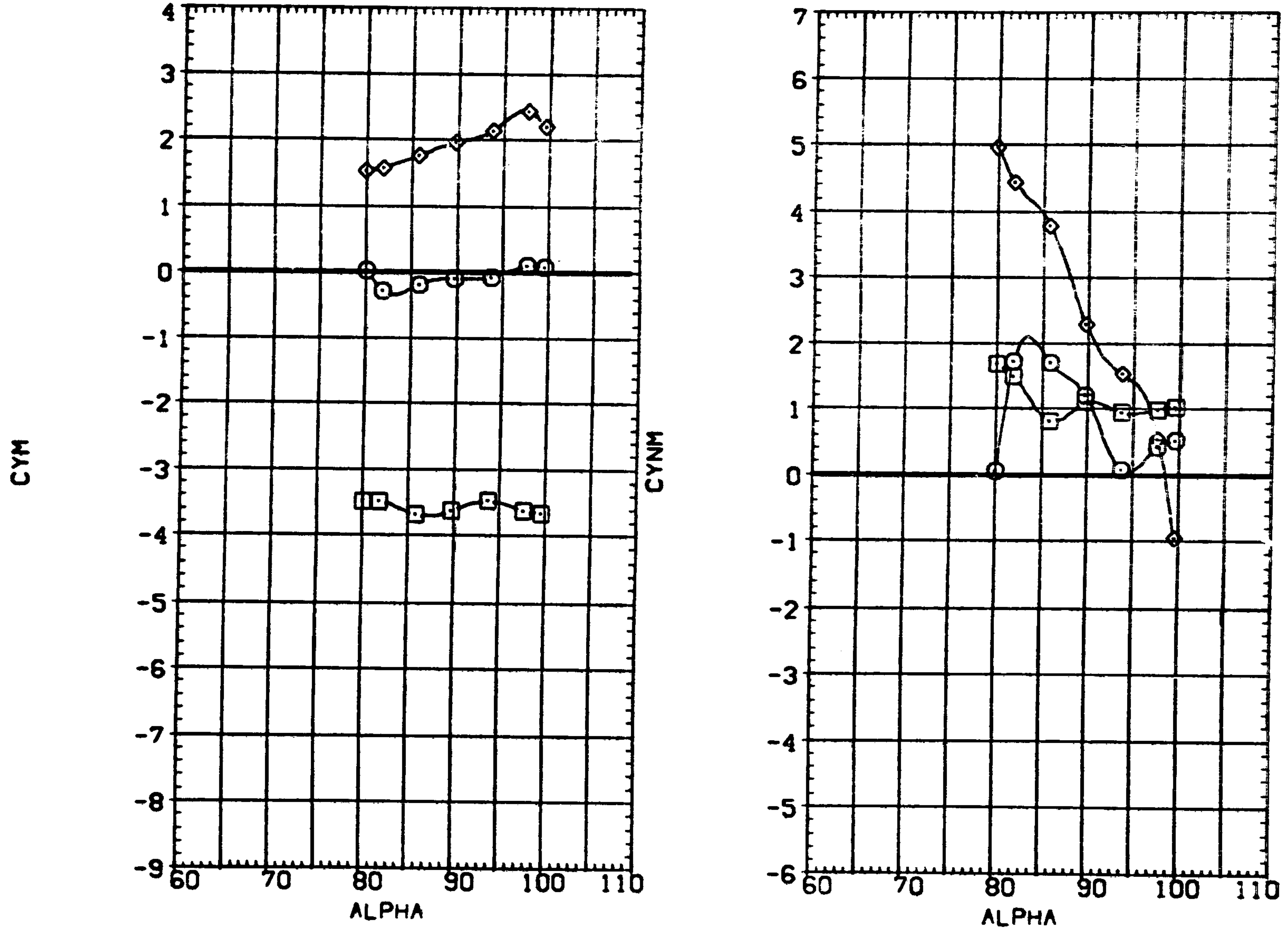
AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

(E)MACH = 3.48

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRKT
(C95027)	○	MSFC 590(SA26F) 142-IN. SRB(139) NBREIS2 ELT	.000	45.000	1.000	2.000
(C95028)	□	MSFC 590(SA26F) 142-IN. SRB(139) NBREIS2 ELT	.000	90.000	1.000	2.000
(C95029)	◇	MSFC 590(SA26F) 142-IN. SRB(139) NBREIS2 ELT	.000	135.000	1.000	2.000

REFERENCE INFORMATION

SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	

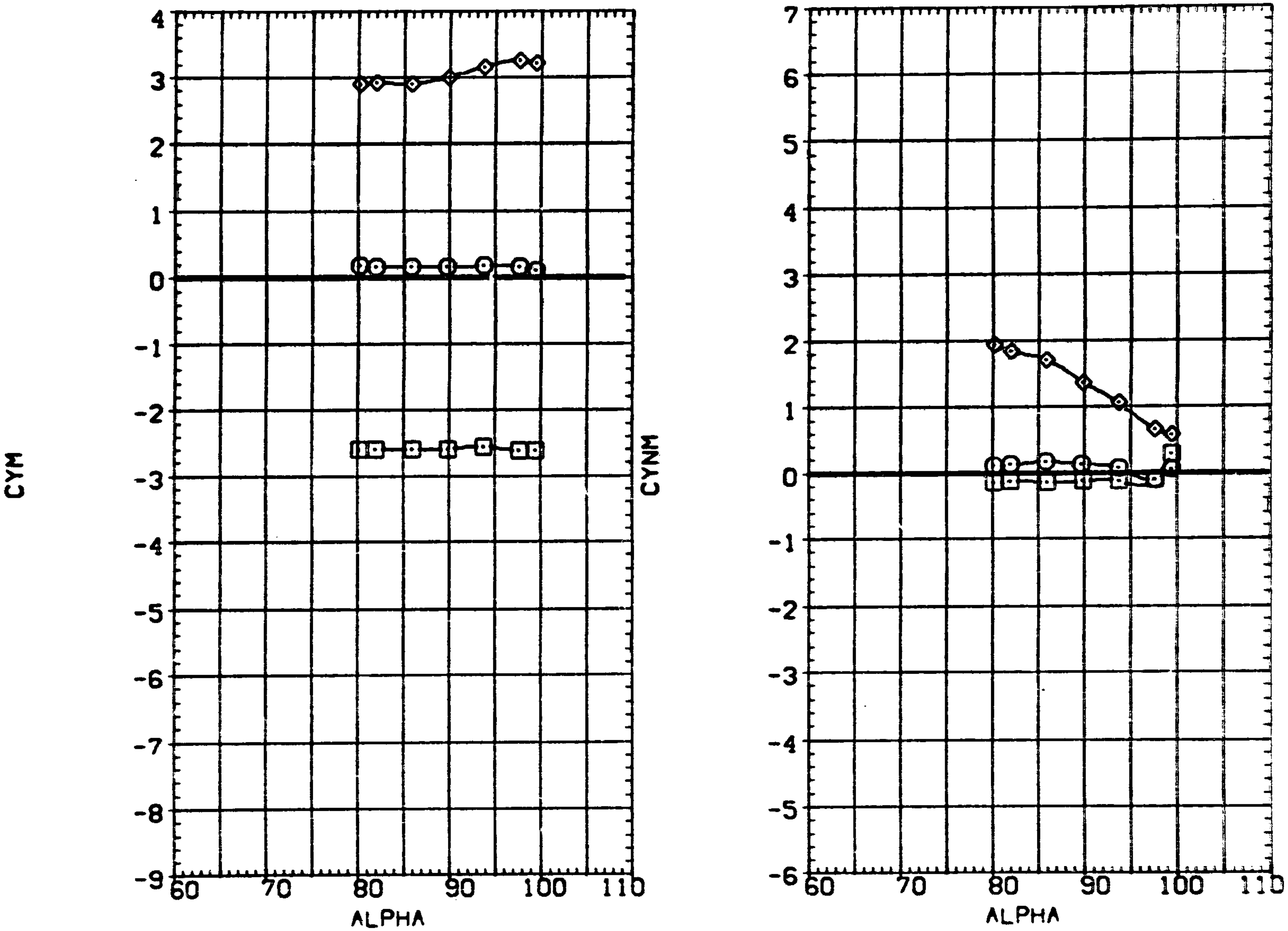


AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

(A)MACH = .60

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRKT
(C95027)	□	MSFC 590(SA26F) 142-IN. SRB(139) NBRE1S2 ELT	.000	45.000	1.000	2.000
(C95028)	○	MSFC 590(SA26F) 142-IN. SRB(139) NBRE1S2 ELT	.000	90.000	1.000	2.000
(C95029)	◇	MSFC 590(SA26F) 142-IN. SRB(139) NBRE1S2 ELT	.000	135.000	1.000	2.000

REFERENCE INFORMATION		
SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	

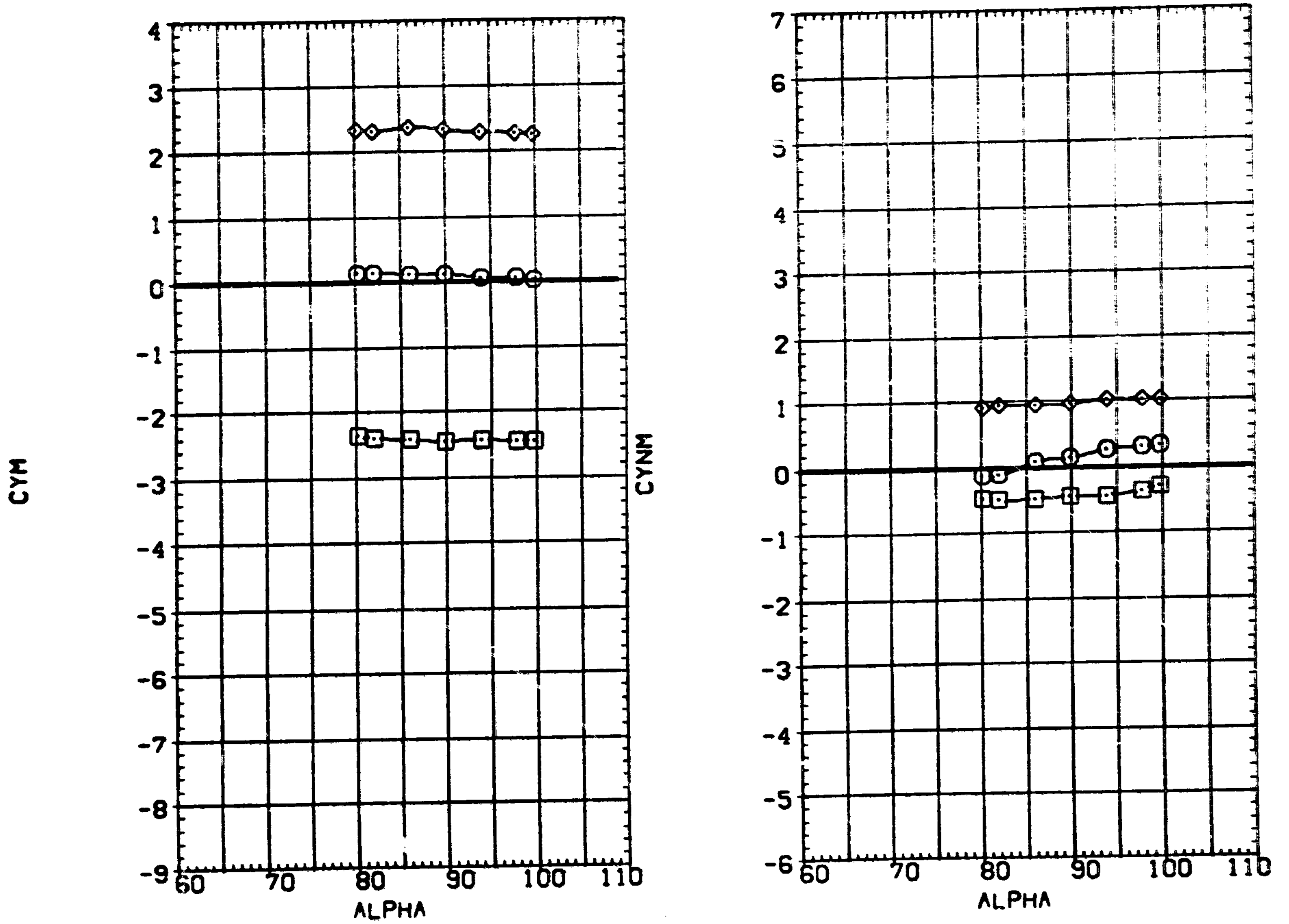


AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

(B)MACH = .90

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRKT
(C95027)	○	MSFC S90(SA26F) 142-IN. SRB(139) NBREIS2 ELT	.000	45.000	1.000	2.000
(C95028)	□	MSFC S90(SA26F) 142-IN. SRB(139) NBREIS2 ELT	.000	90.000	1.000	2.000
(C95029)	◇	MSFC S90(SA26F) 142-IN. SRB(139) NBREIS2 ELT	.000	135.000	1.000	2.000

REFERENCE INFORMATION		
SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	



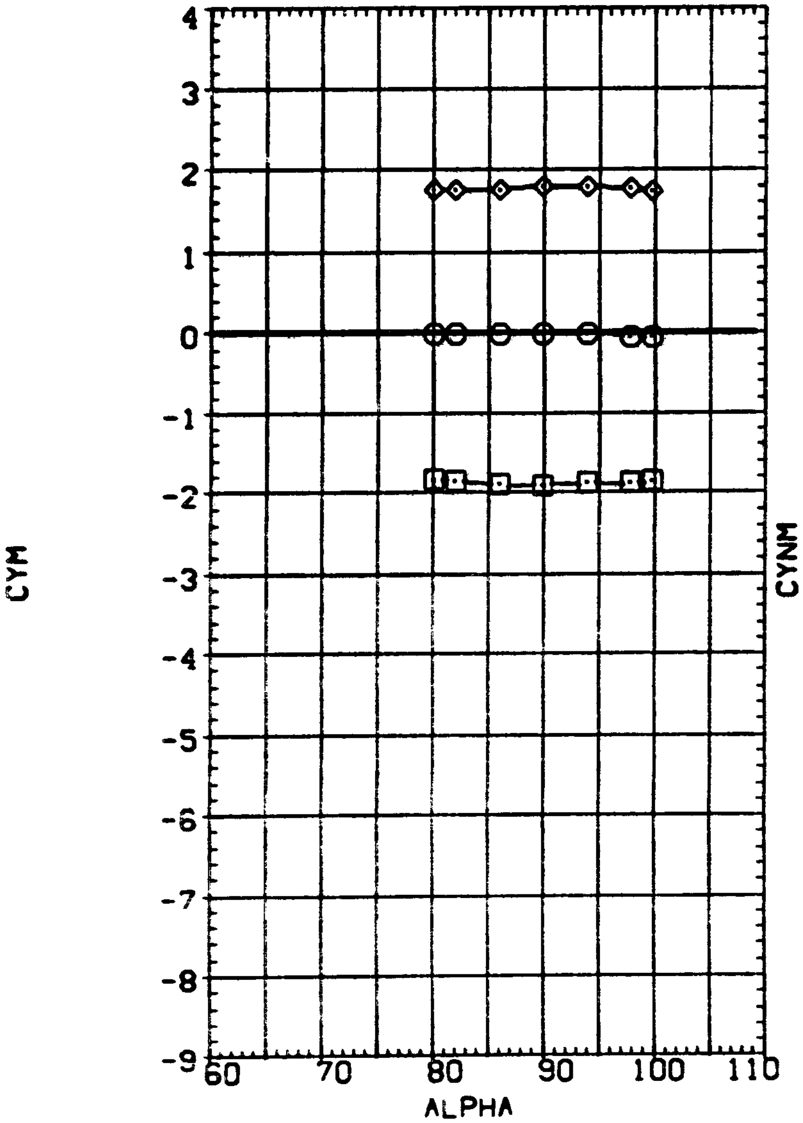
AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

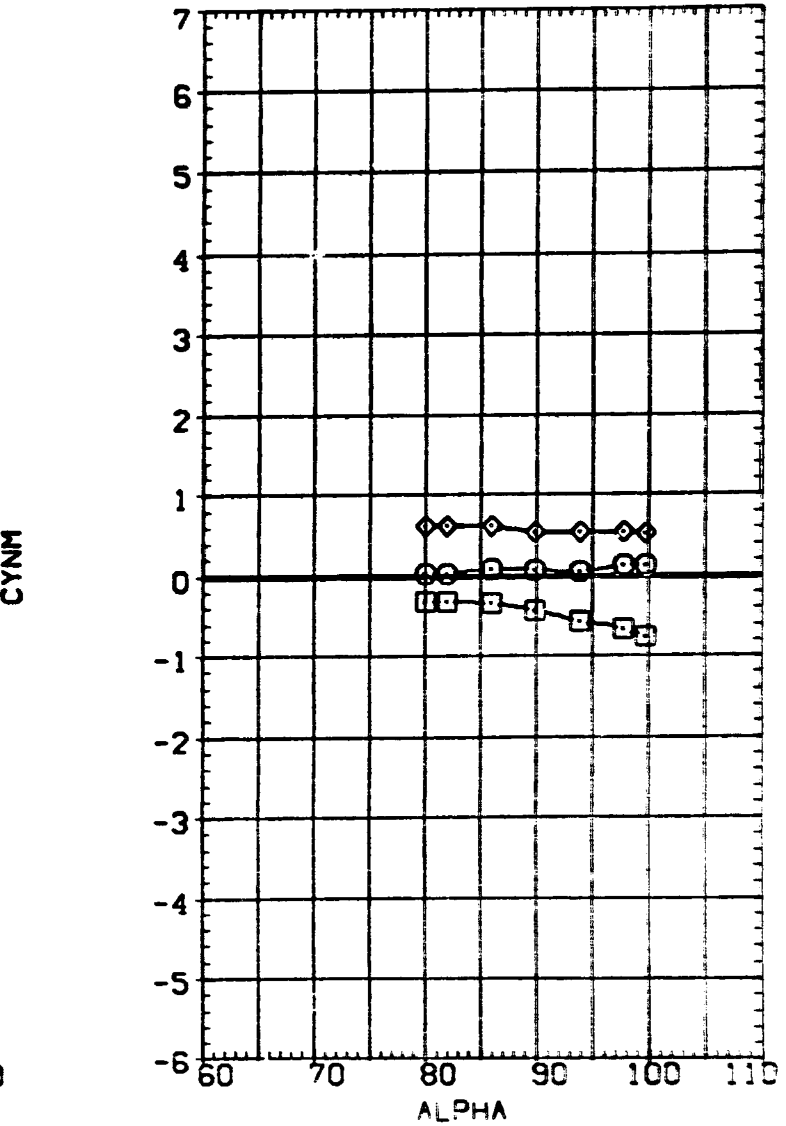
(C)MACH - 1.20

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRKT
(C95027)	□	MSFC 590(SA26F) 142-IN. SRB(139) NBRE1S2 ELT	.000	45.000	1.000	2.000
(C95028)	○	MSFC 590(SA26F) 142-IN. SRB(139) NBRE1S2 ELT	.000	90.000	1.000	2.000
(C95029)	◇	MSFC 590(SA26F) 142-IN. SRB(139) NBRE1S2 ELT	.000	135.000	1.000	2.000

REFERENCE INFORMATION

SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	



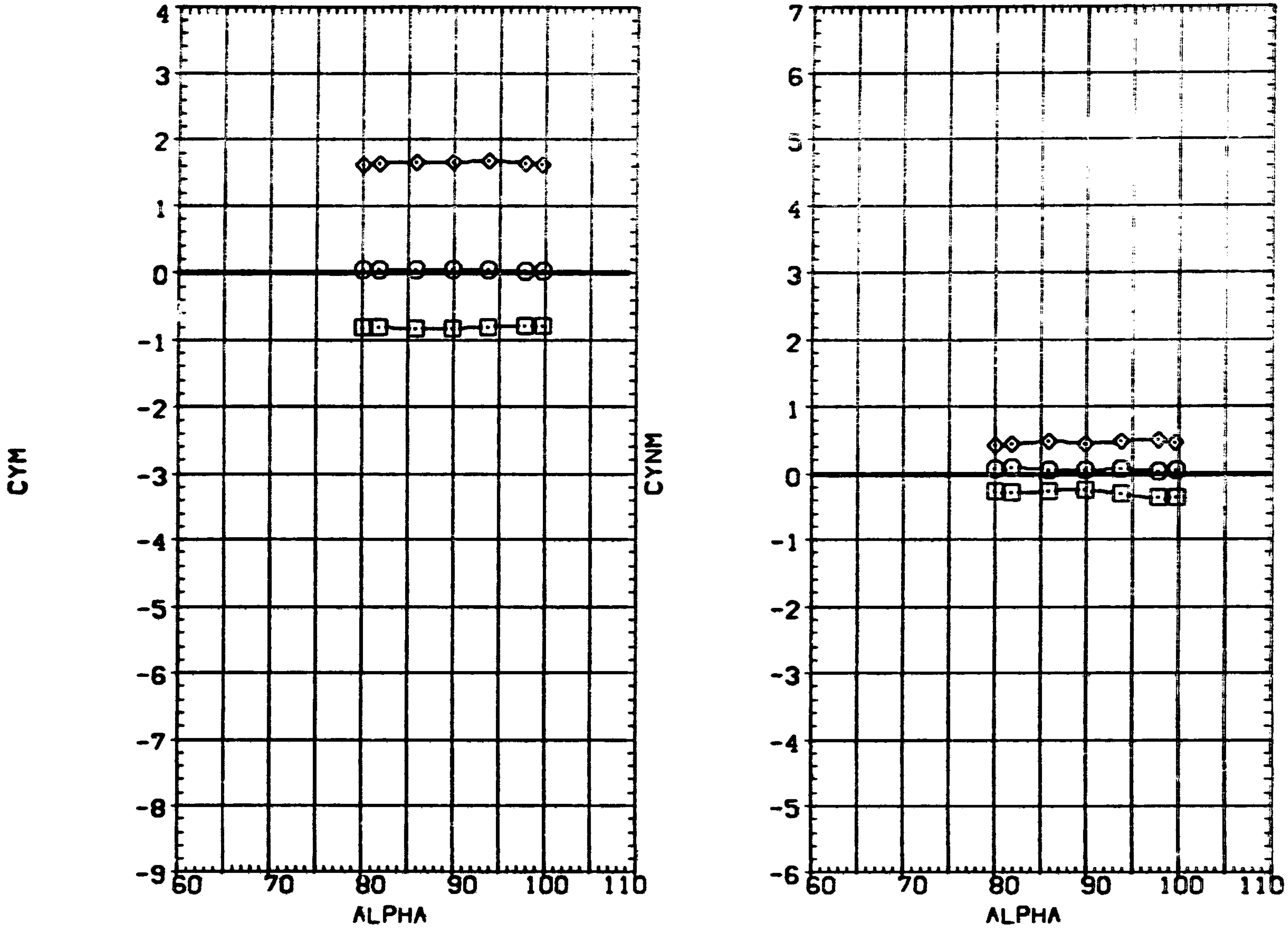


AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

(D)MAC- = 1.96

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRKT
(C95027)	○	MSFC 590(SA26F) 142-IN. SRB(139) NBRE1S2 ELT	.000	45.000	1.000	2.000
(C95028)	☐	MSFC 590(SA26F) 142-IN. SRB(139) NBRE1S2 ELT	.000	90.000	1.000	2.000
(C95029)	◇	MSFC 590(SA26F) 142-IN. SRB(139) NBRE1S2 ELT	.000	135.000	1.000	2.000

REFERENCE	INFORMATION	
SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	



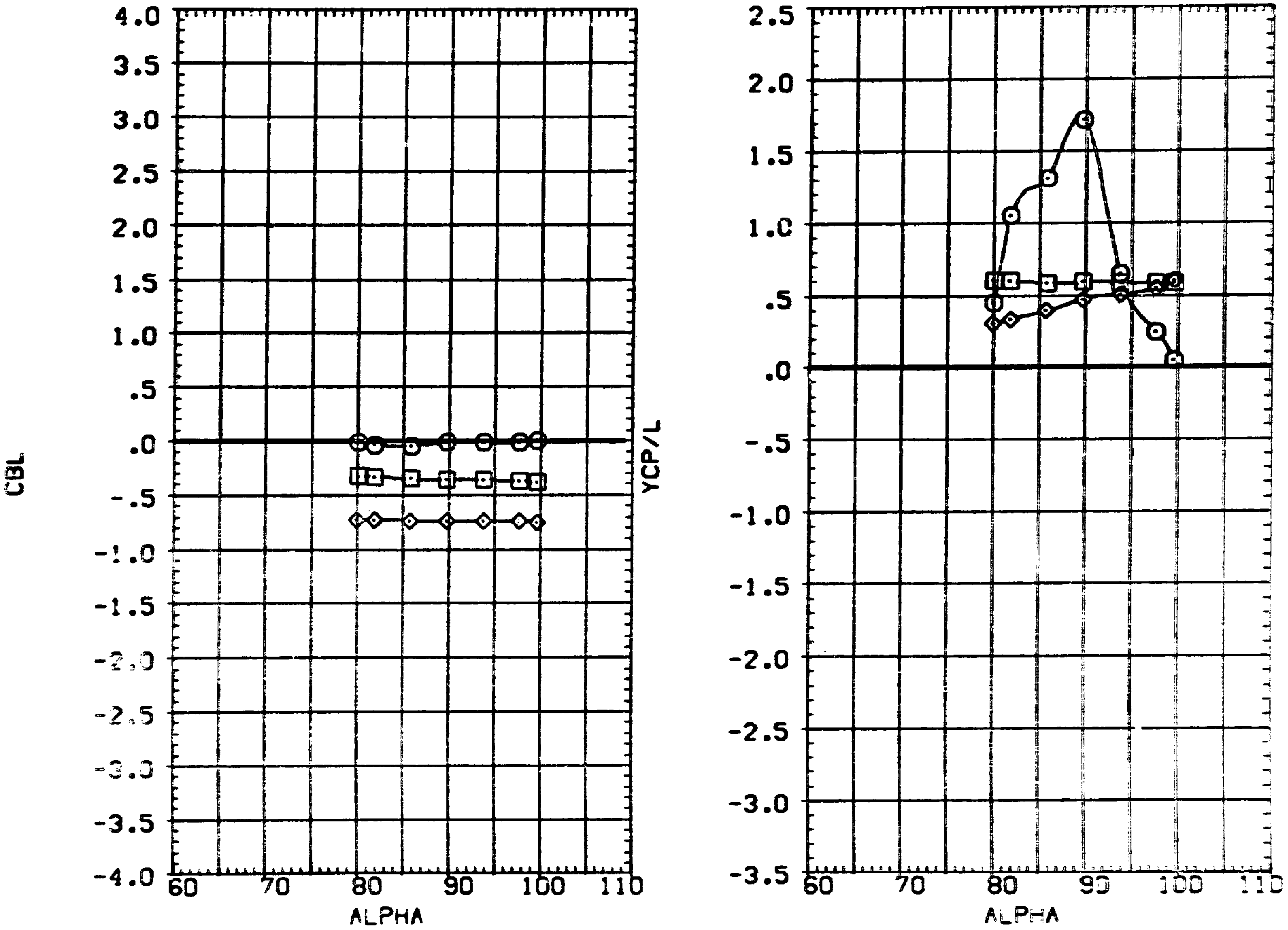
AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

(E)MACH = 3.48

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRKT
[C95027]	○	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S2 ELT	.000	45.000	1.000	2.000
[C95028]	□	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S2 ELT	.000	90.000	1.000	2.000
[C95029]	◇	MSFC 590(SA26F) 142-IN. SRB(139) NBRE(S2 ELT	.000	135.000	1.000	2.000

REFERENCE INFORMATION

SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	



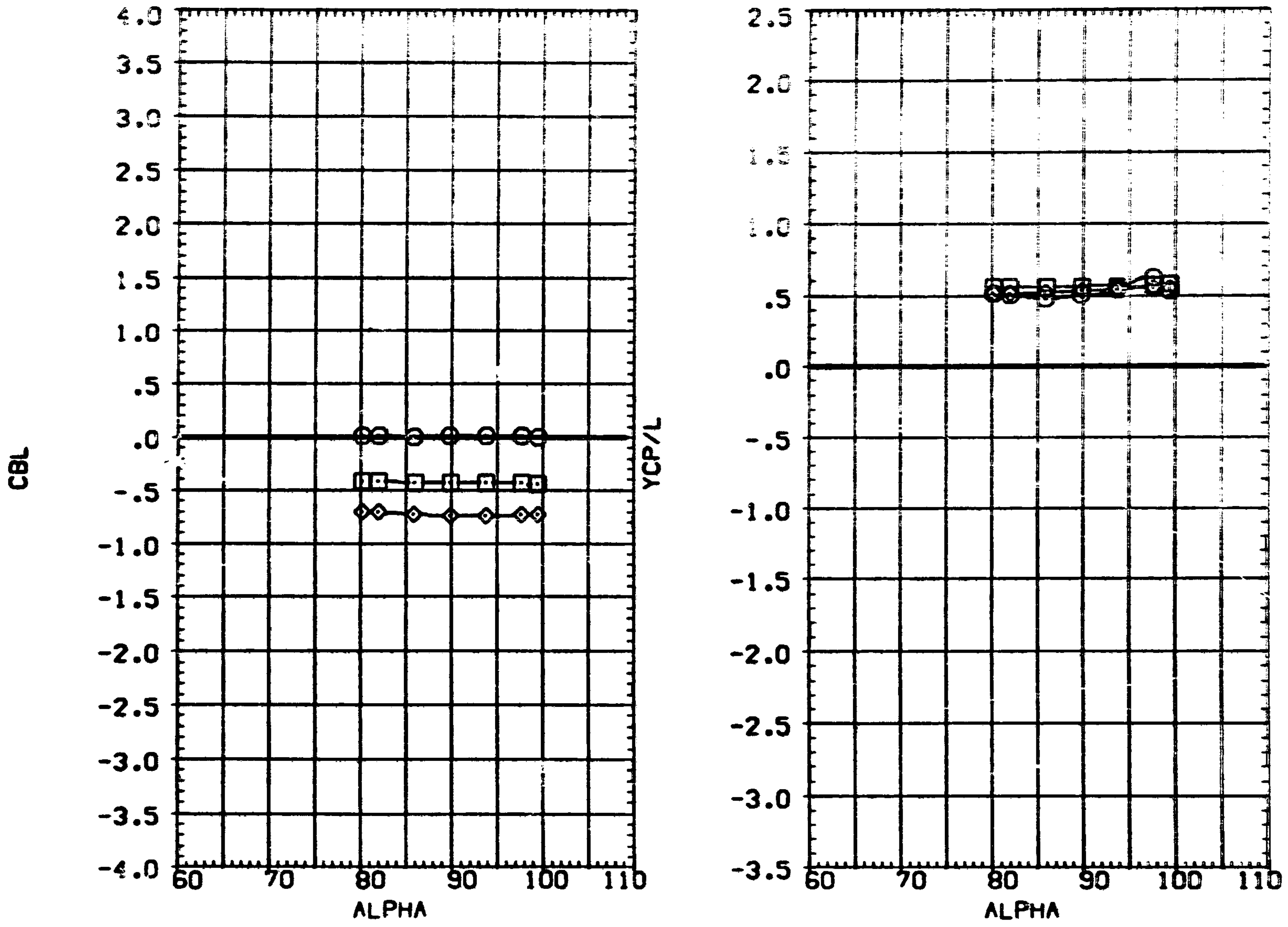
AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

(A)MACH = .60

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRKT
[C95027]	○	MSFC 590(SA26F) 142-IN. SRB(139) NBRE1S2 ELT	.000	45.000	1.000	2.000
[C95028]	□	MSFC 590(SA26F) 142-IN. SRB(139) NBRE1S2 ELT	.000	90.000	1.000	2.000
[C95029]	◇	MSFC 590(SA26F) 142-IN. SRB(139) NBRE1S2 ELT	.000	135.000	1.000	2.000

REFERENCE INFORMATION

SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	



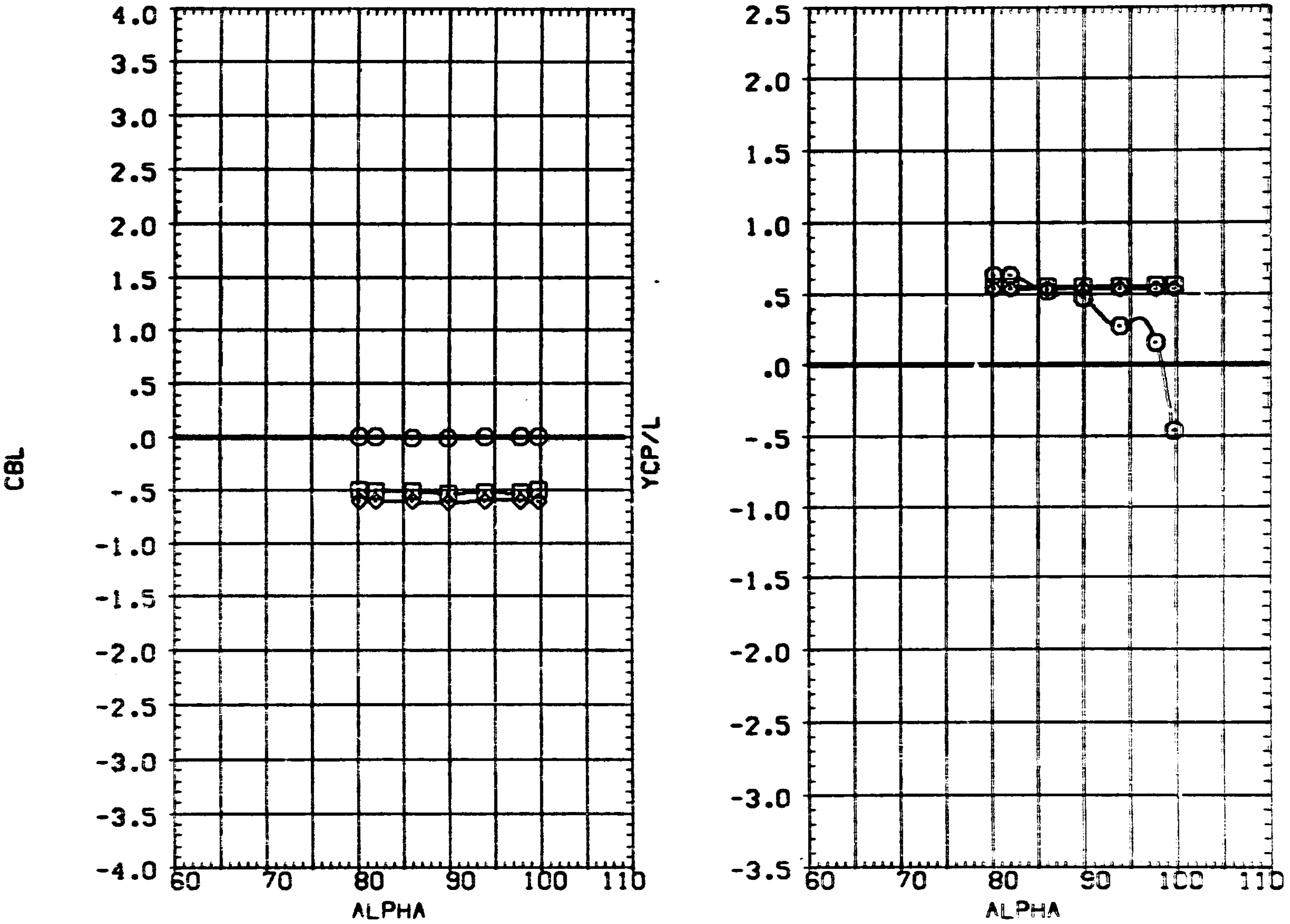
AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

(B)MACH = .90

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRKT
(C95027)	○	MSFC 590(SA26F) 142-IN. SRB(139) N8REIS2 ELT	.000	45.000	1.000	2.000
(C95028)	□	MSFC 590(SA26F) 142-IN. SRB(139) N8REIS2 ELT	.000	90.000	1.000	2.000
(C95029)	◇	MSFC 590(SA26F) 142-IN. SRB(139) N8REIS2 ELT	.000	135.000	1.000	2.000

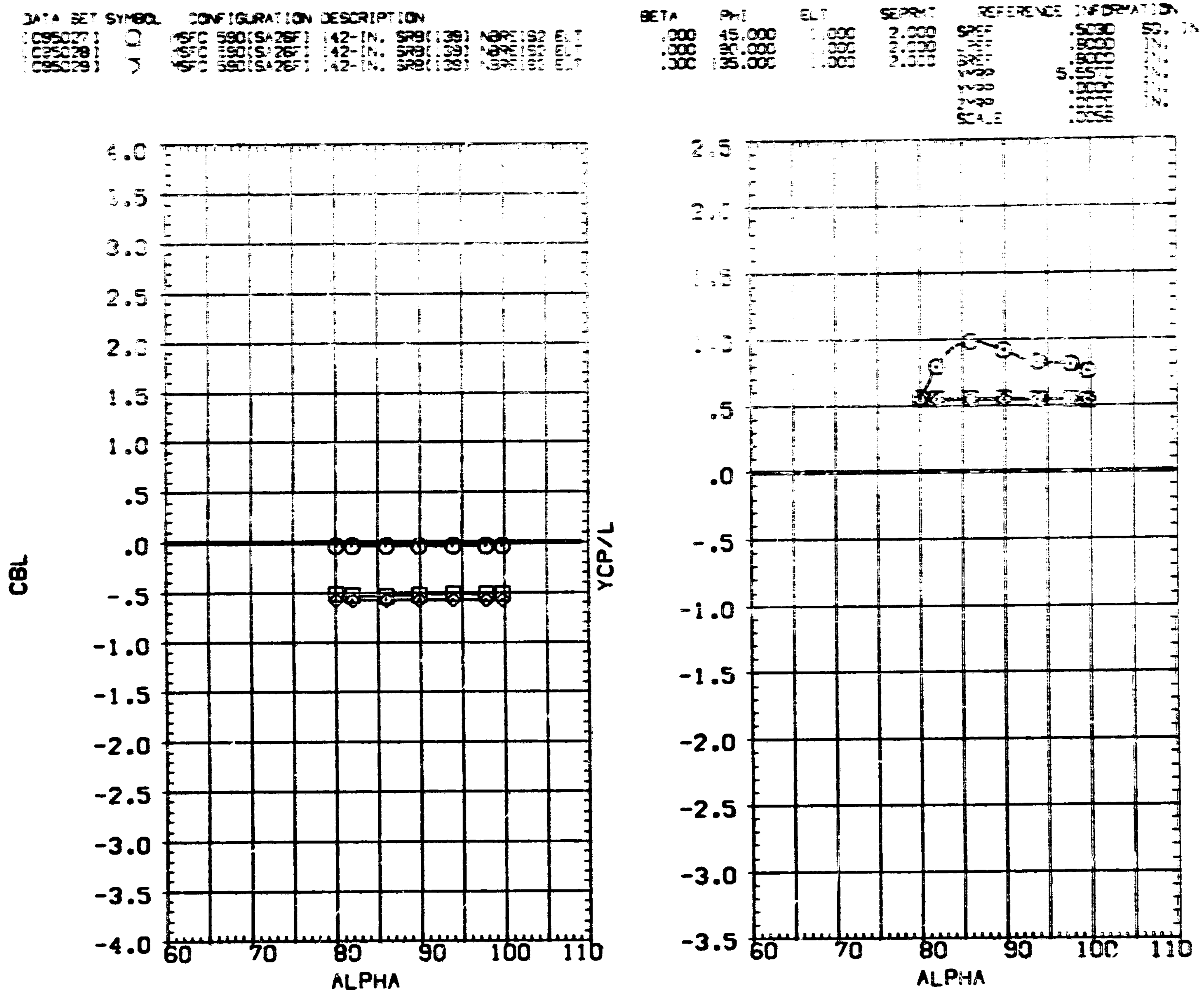
REFERENCE INFORMATION

SREF	.5030	SQ. IN.
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	



AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

(C)MACH = 1.20



AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

(D)MAC- = 1.96

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	SEPRKT
[C95027]	○	MSFC 590[SA26F] 142-IN. SRB(139) NBREIS2 ELT	.000	45.000	1.000	2.000
[C95028]	□	MSFC 590[SA26F] 142-IN. SRB(139) NBREIS2 ELT	.000	90.000	1.000	2.000
[C95029]	◇	MSFC 590[SA26F] 142-IN. SRB(139) NBREIS2 ELT	.000	135.000	1.000	2.000

REFERENCE INFORMATION

SREF [illegible]

LREF [illegible]

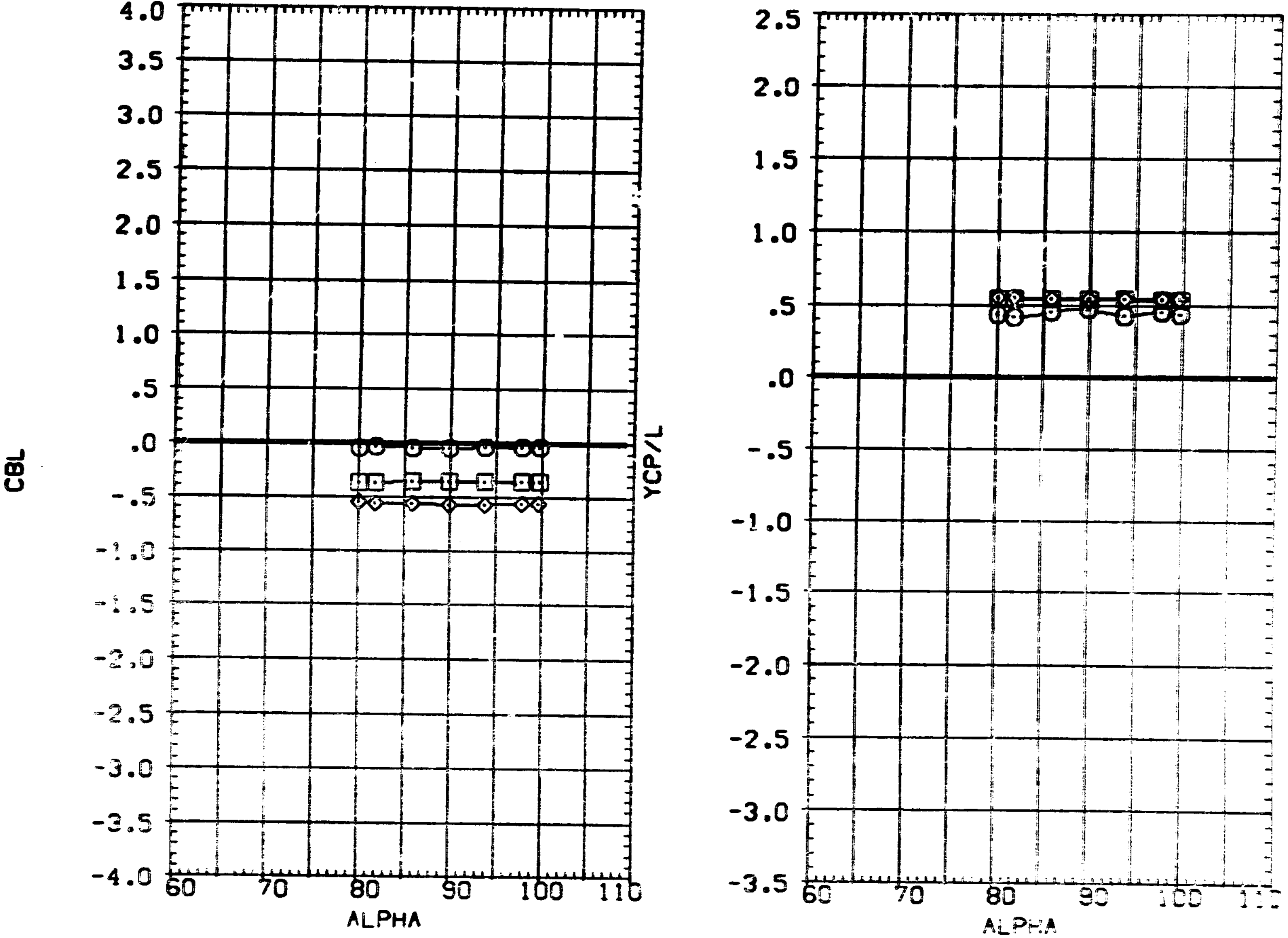
BREF [illegible]

XMRP 5.[illegible] IN.

YMRP [illegible] IN.

ZMRP [illegible] IN.

SCALE .0056

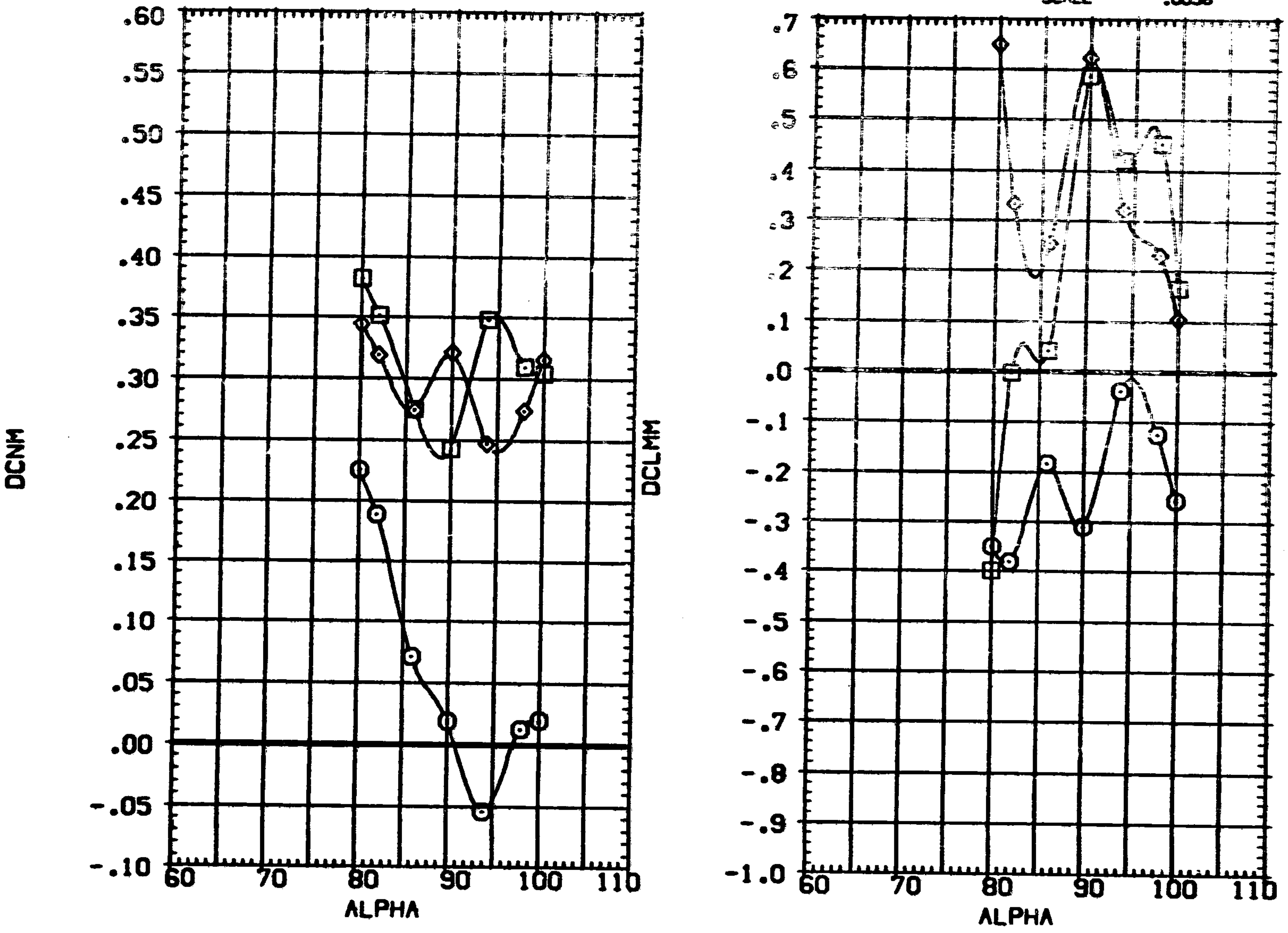


AERODYNAMIC CHARACTERISTICS OF A SRB WITH SEPARATION ROCKETS AND ELECT. TUNNEL

(E)MACH = 3.48

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	EL	DSEPRT
(E95018)	○	MSFC 590(SA26F) 142-IN. SRB(139) EFFECT OF S1-S2	.000	45.000	1.000	1.000
(E95019)	□	MSFC 590(SA26F) 142-IN. SRB(139) EFFECT OF S1-S2	.000	90.000	1.000	1.000
(E95020)	◇	MSFC 590(SA26F) 142-IN. SRB(139) EFFECT OF S1-S2	.000	135.000	1.000	1.000

REFERENCE INFORMATION		
SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	



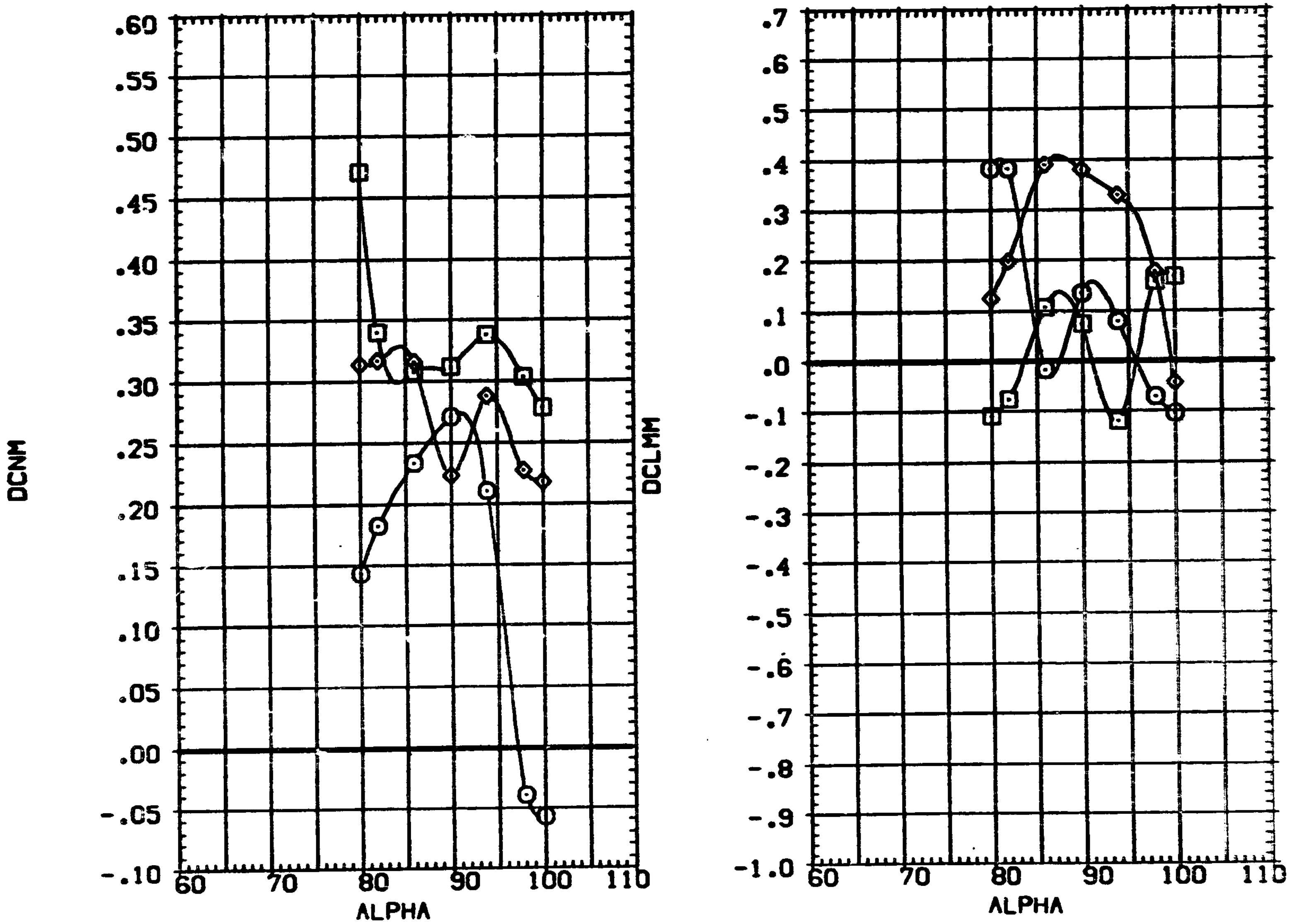
EFFECT OF SEPARATION ROCKET HEIGHT

(A)MACH = .60

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	DSEPRT
(E95018)	○	MSFC 590(SA26F) 142-IN. SRB(139) EFFECT OF S1-S2	.000	45.000	1.000	1.000
(E95019)	□	MSFC 590(SA26F) 142-IN. SRB(139) EFFECT OF S1-S2	.000	90.000	1.000	1.000
(E95020)	◇	MSFC 590(SA26F) 142-IN. SRB(139) EFFECT OF S1-S2	.000	135.000	1.000	1.000

REFERENCE INFORMATION

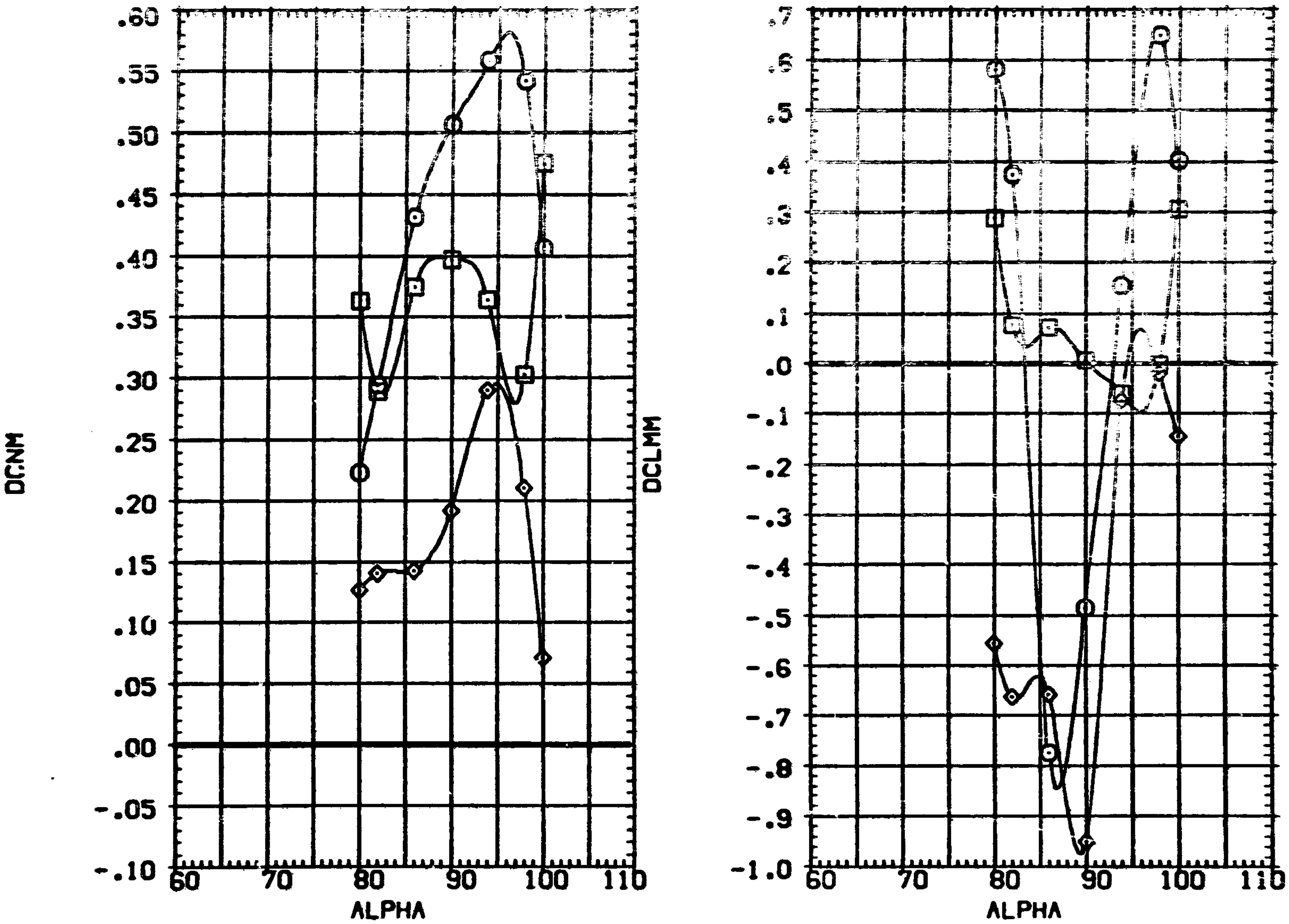
SREF	.5030	SQ. IN
LREF	.9000	IN.
BREF	.9000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	



EFFECT OF SEPARATION ROCKET HEIGHT

(B)MACH = .90

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	DSEPRT	REFERENCE INFORMATION		
(E95018)	○	MSFC 590(SA26F) 142-IN. SRB(139) EFFECT OF S1-S2	.000	45.000	1.000	1.000	SREF	.5030	SQ. IN
(E95019)	□	MSFC 590(SA26F) 142-IN. SRB(139) EFFECT OF S1-S2	.000	90.000	1.000	1.000	LREF	.8000	IN.
(E95020)	◇	MSFC 590(SA26F) 142-IN. SRB(139) EFFECT OF S1-S2	.000	135.000	1.000	1.000	BREF	.8000	IN.
							XMRP	5.5570	IN.
							YMRP	.0000	IN.
							ZMRP	.0000	IN.
							SCALE	.0056	



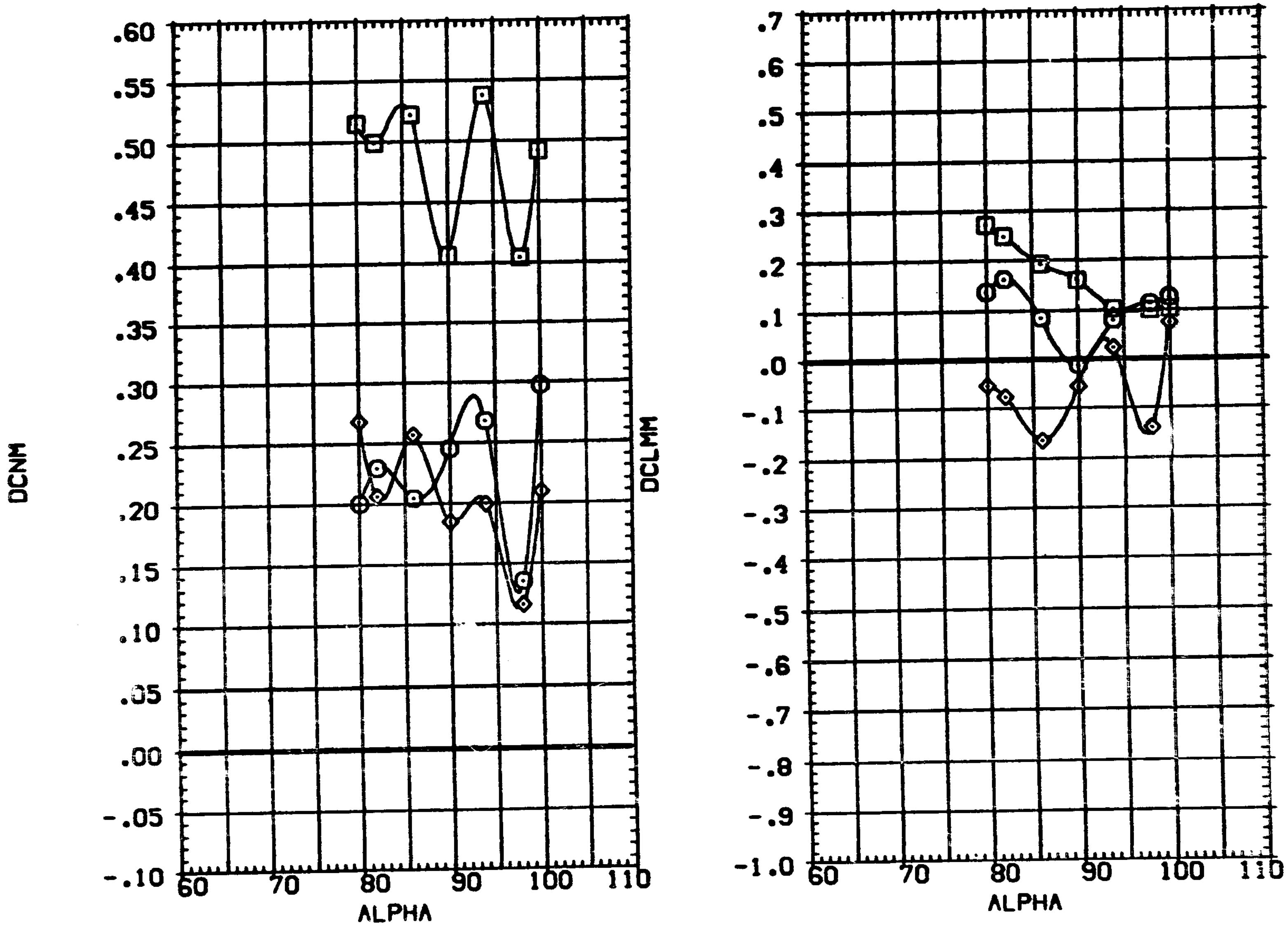
EFFECT OF SEPARATION ROCKET HEIGHT

(C)MACH = 1.20

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	DSEPRT
(E95018)	○	MSFC 590(SA26F) 142-IN. SRB(139) EFFECT OF S1-S2	.000	45.000	1.000	1.000
(E95019)	□	MSFC 590(SA26F) 142-IN. SRB(139) EFFECT OF S1-S2	.000	90.000	1.000	1.000
(E95020)	◇	MSFC 590(SA26F) 142-IN. SRB(139) EFFECT OF S1-S2	.000	135.000	1.000	1.000

REFERENCE INFORMATION

SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	

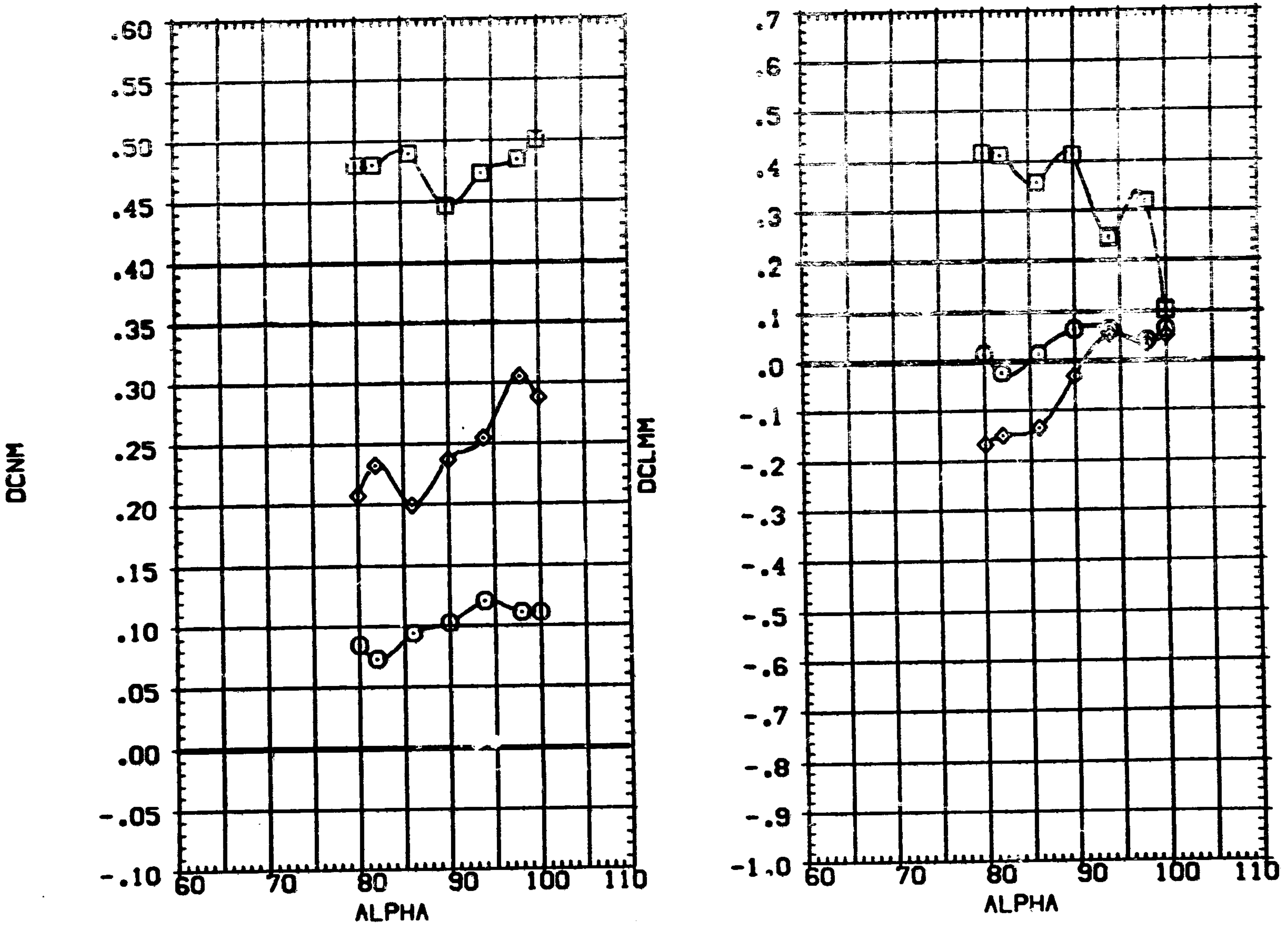


EFFECT OF SEPARATION ROCKET HEIGHT

(D)MACH = 1.96

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	DSEPRT
(E95018)	□	MSFC 590(SA26F) 142-IN. SRB(139) EFFECT OF S1-S2	.000	45.000	1.000	1.000
(E95019)	○	MSFC 590(SA26F) 142-IN. SRB(139) EFFECT OF S1-S2	.000	90.000	1.000	1.000
(E95020)	◇	MSFC 590(SA26F) 142-IN. SRB(139) EFFECT OF S1-S2	.000	135.000	1.000	1.000

REFERENCE INFORMATION		
SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	

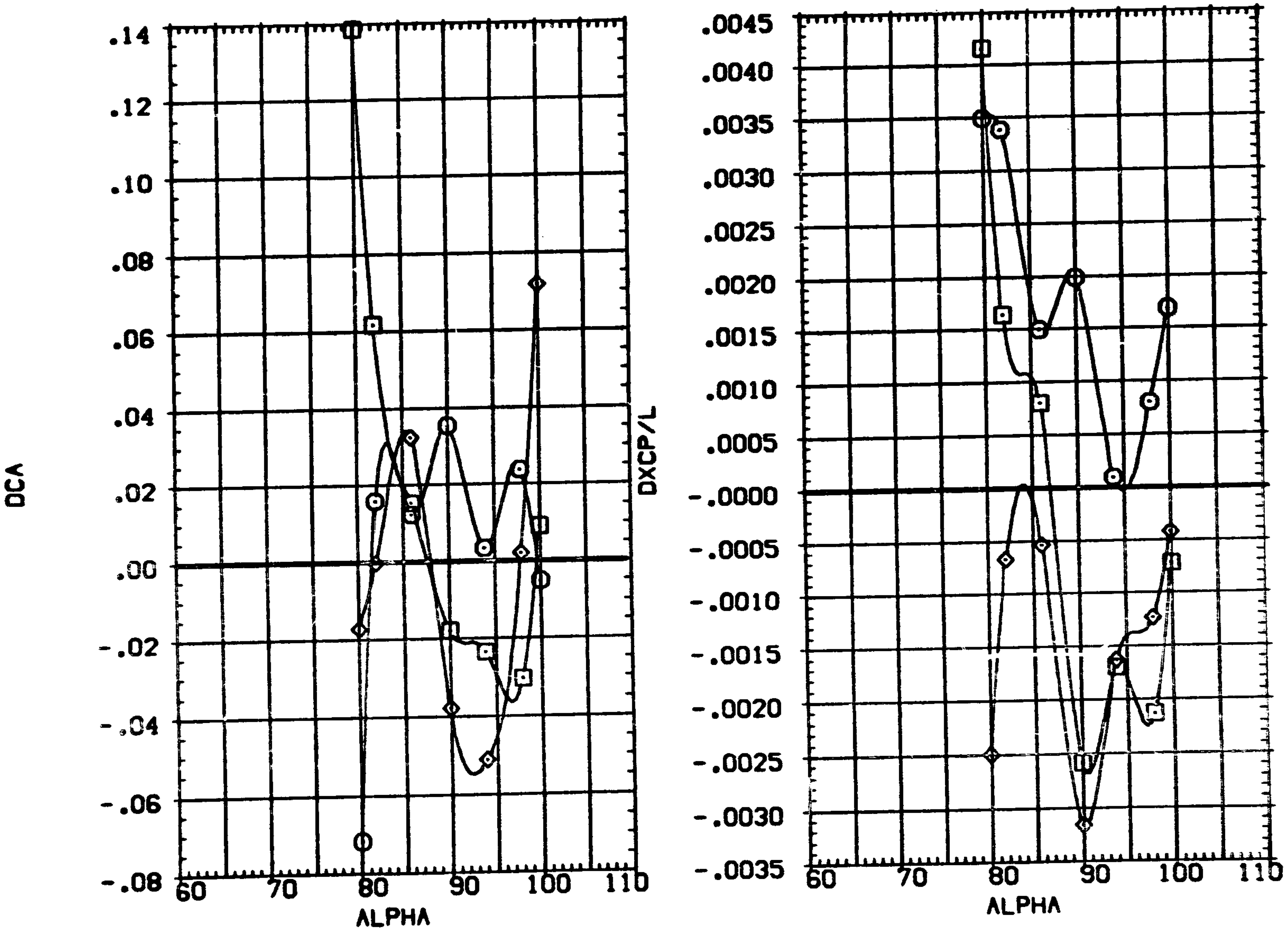


EFFECT OF SEPARATION ROCKET HEIGHT

(E)MACH = 3.48

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	DSEPRT
(E95018)	○	MSFC 590(SA26F) 142-IN. SRB(139) EFFECT OF S1-S2	.000	45.000	1.000	1.000
(E95019)	□	MSFC 590(SA26F) 142-IN. SRB(139) EFFECT OF S1-S2	.000	90.000	1.000	1.000
(E95020)	◇	MSFC 590(SA26F) 142-IN. SRB(139) EFFECT OF S1-S2	.000	135.000	1.000	1.000

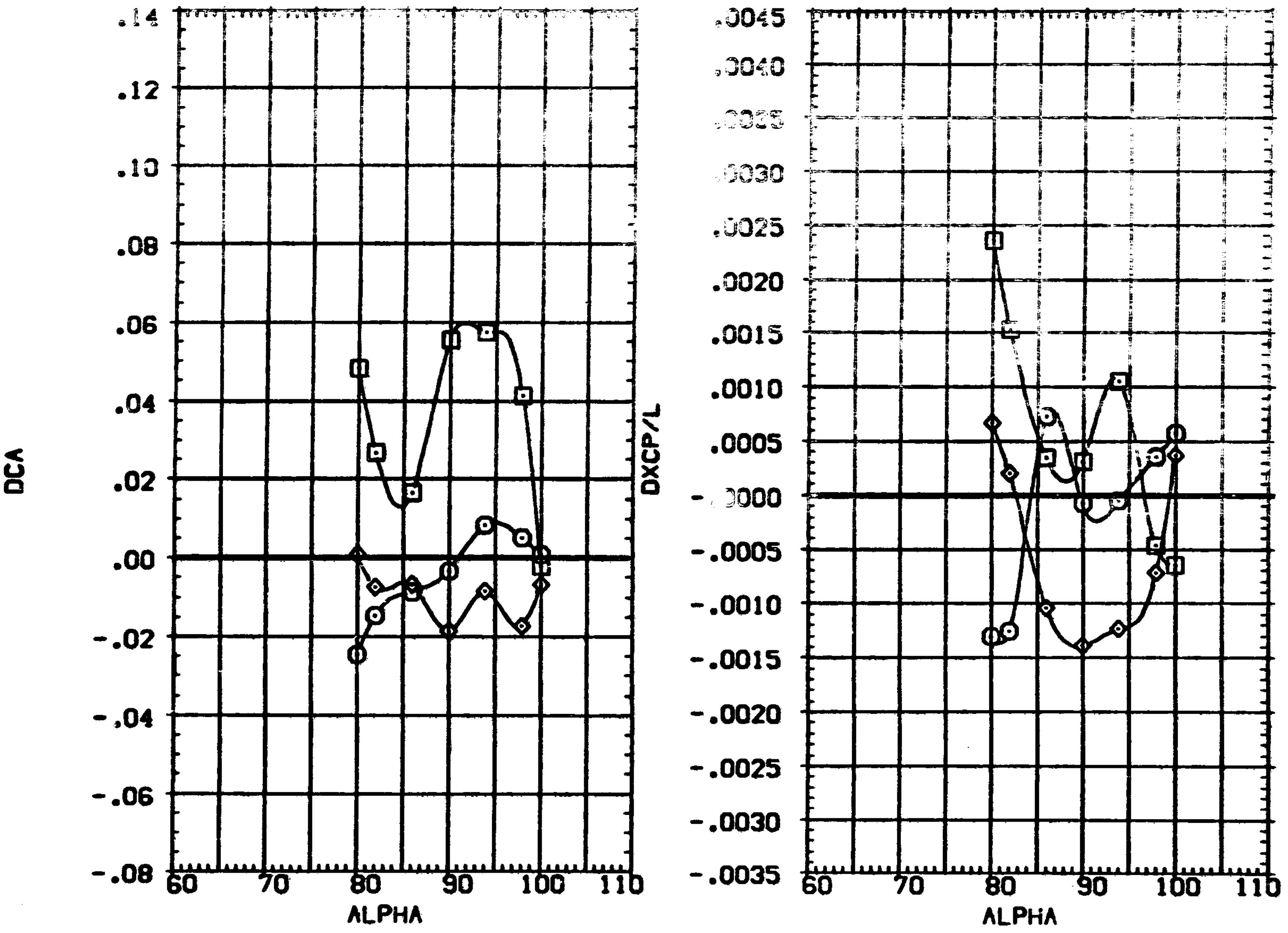
REFERENCE INFORMATION		
SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	



EFFECT OF SEPARATION ROCKET HEIGHT

(A)MACH = .60

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	DSEPRT	REFERENCE INFORMATION		
(E95C18)	○	MSFC 590(SA26F) 142-IN. SRB(139) EFFECT OF S1-S2	.000	45.000	1.000	1.000	SREF	.5030	SQ. IN.
(E95019)	□	MSFC 590(SA26F) 142-IN. SRB(139) EFFECT OF S1-S2	.000	90.000	1.000	1.000	LREF	.8000	IN.
(E95020)	◇	MSFC 590(SA26F) 142-IN. SRB(139) EFFECT OF S1-S2	.000	135.000	1.000	1.000	BREF	.8000	IN.
							XMRP	5.5570	IN.
							YMRP	.0000	IN.
							ZMRP	.0000	IN.
							SCALE	.0056	

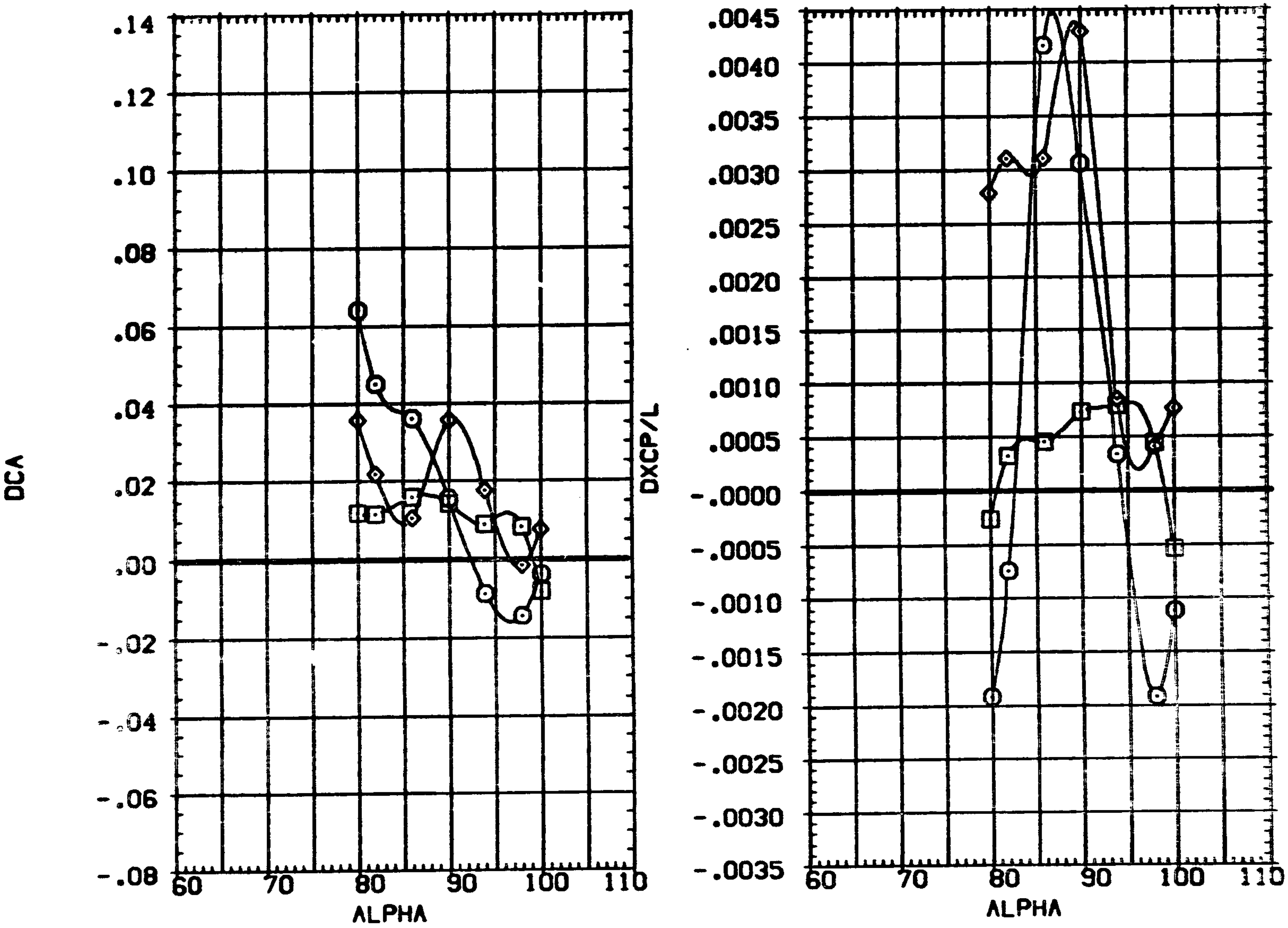


EFFECT OF SEPARATION ROCKET HEIGHT

(B)MACH = .90

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	DSEPRT
(E95019)	○	MSFC 590(SA26F) 142-IN. SRB(139) EFFECT OF SI-S2	.000	45.000	1.000	1.000
(E95019)	□	MSFC 590(SA26F) 142-IN. SRB(139) EFFECT OF SI-S2	.000	90.000	1.000	1.000
(E95020)	◇	MSFC 590(SA26F) 142-IN. SRB(139) EFFECT OF SI-S2	.000	135.000	1.000	1.000

REFERENCE	INFORMATION	
SREF	.5030	SQ. IN
LREF	.3000	IN.
BREF	.6000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	

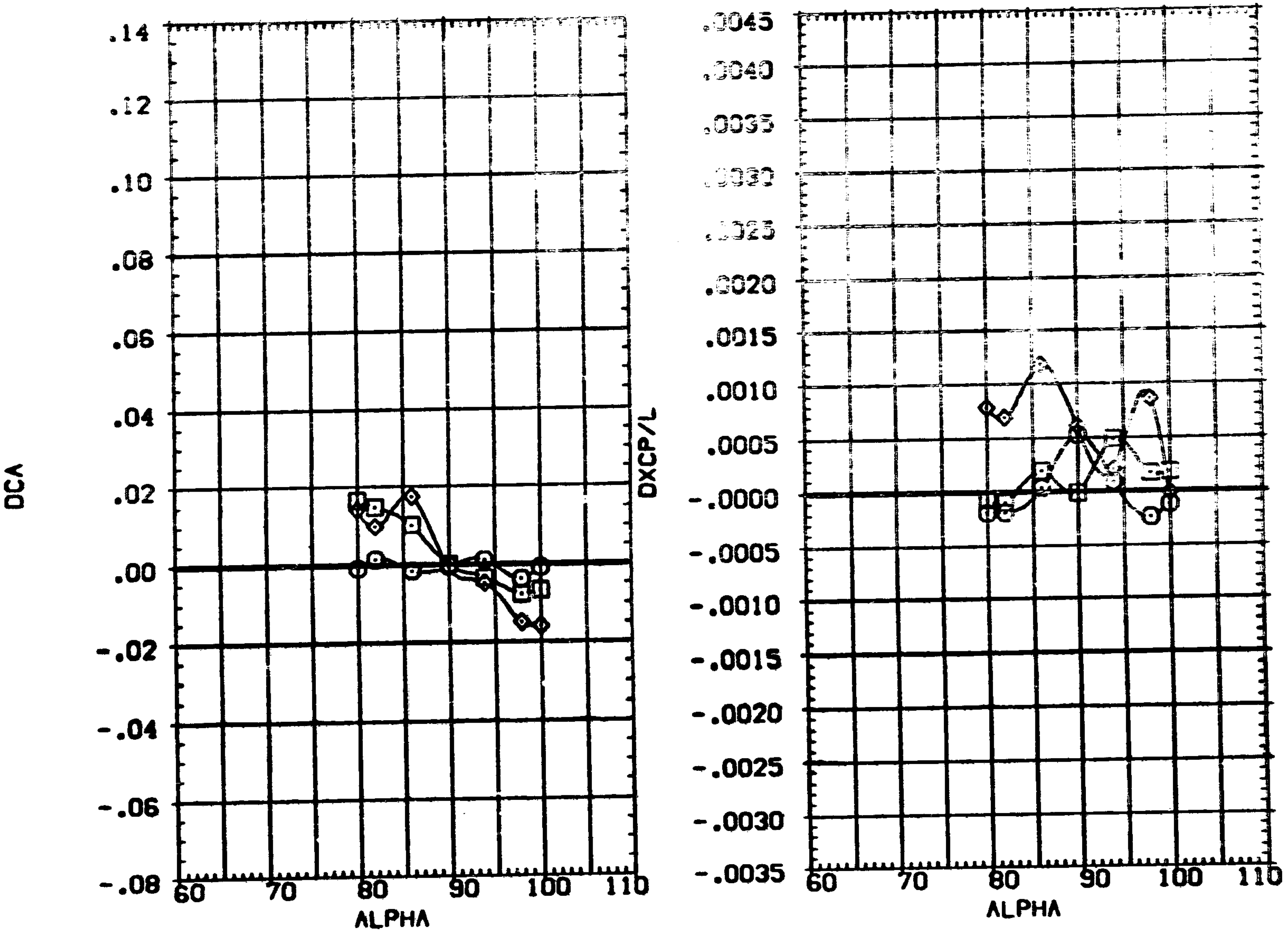


EFFECT OF SEPARATION ROCKET HEIGHT

(C)MACH = 1.20

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	DSEPRT
(E95018)	○	MSFC 590(SA26F) 142-IN. SRB(139) EFFECT OF S1-S2	.000	45.000	1.000	1.000
(E95019)	□	MSFC 590(SA26F) 142-IN. SRB(139) EFFECT OF S1-S2	.000	90.000	1.000	1.000
(E95020)	◇	MSFC 590(SA26F) 142-IN. SRB(139) EFFECT OF S1-S2	.000	135.000	1.000	1.000

REFERENCE	INFORMATION	
SREF	.5030	SQ. IN.
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	

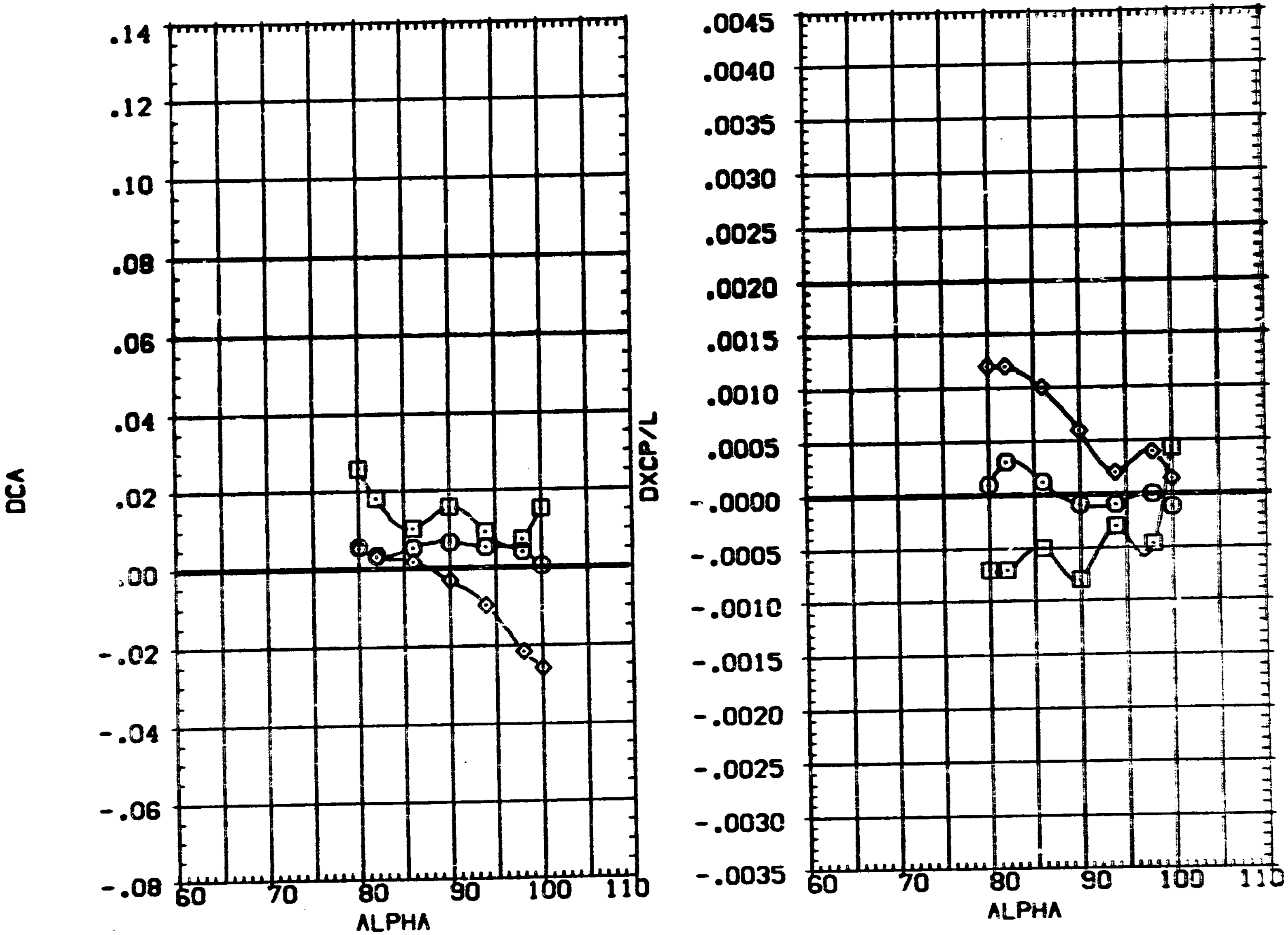


EFFECT OF SEPARATION ROCKET HEIGHT

(D)MACH = 1.96

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	DSEPRT
(E95018)	○	MSFC 590(SA26F) 142-IN. SRB(139) EFFECT OF S1-S2	.000	45.000	1.000	1.000
(E95019)	☐	MSFC 590(SA26F) 142-IN. SRB(139) EFFECT OF S1-S2	.000	90.000	1.000	1.000
(E95020)	◇	MSFC 590(SA26F) 142-IN. SRB(139) EFFECT OF S1-S2	.000	135.000	1.000	1.000

REFERENCE INFORMATION		
SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	

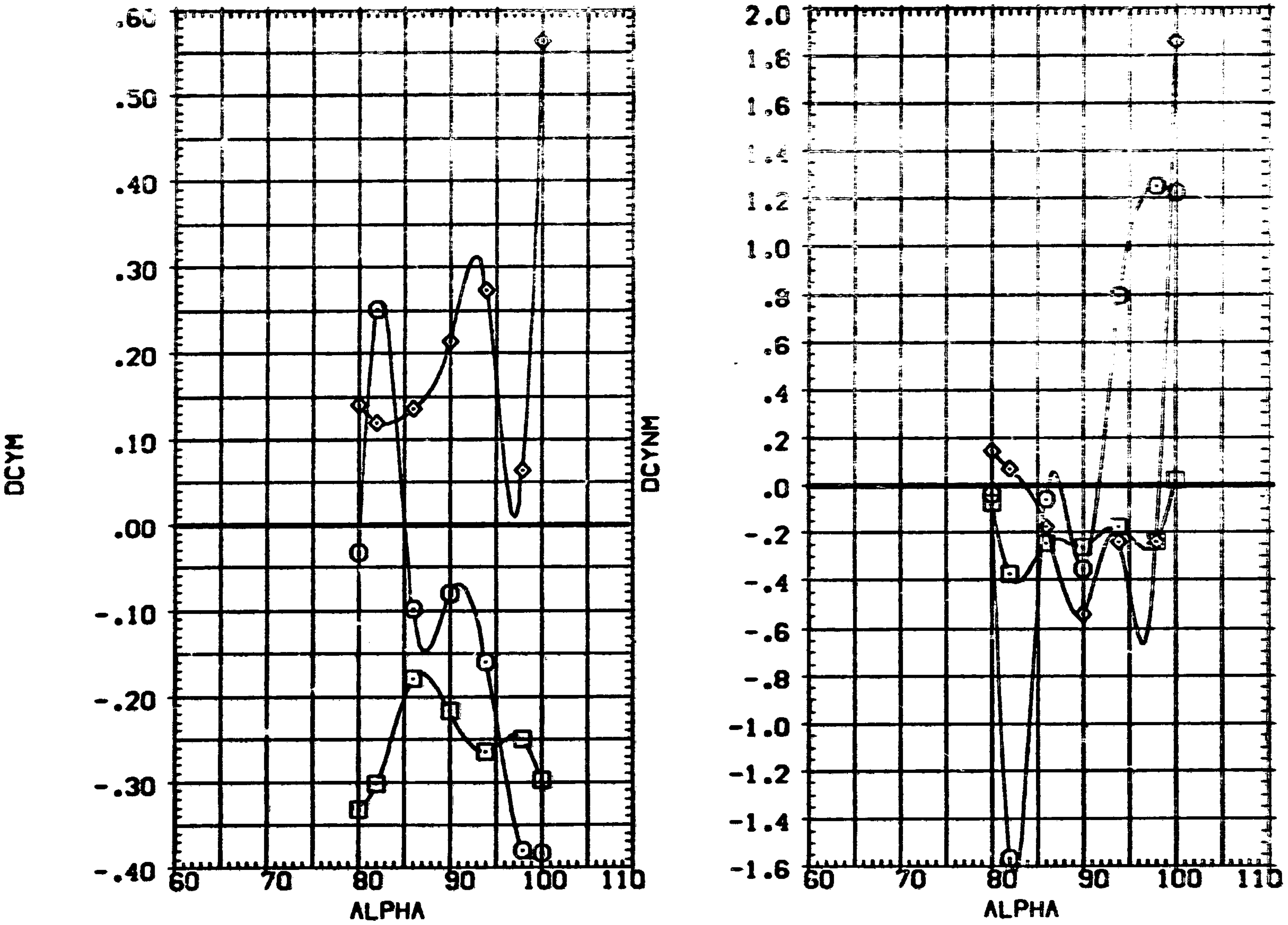


EFFECT OF SEPARATION ROCKET HEIGHT

(E)MACH = 3.48

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	DBEPRT
(E95C18)	○	MSFC 590(SA26F) 142-IN. SRB(138) EFFECT OF S1-S2	.000	45.000	1.000	1.000
(E95C19)	□	MSFC 590(SA26F) 142-IN. SRB(138) EFFECT OF S1-S2	.000	90.000	1.000	1.000
(E95C20)	◇	MSFC 590(SA26F) 142-IN. SRB(138) EFFECT OF S1-S2	.000	135.000	1.000	1.000

REFERENCE	INFORMATION	
SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	

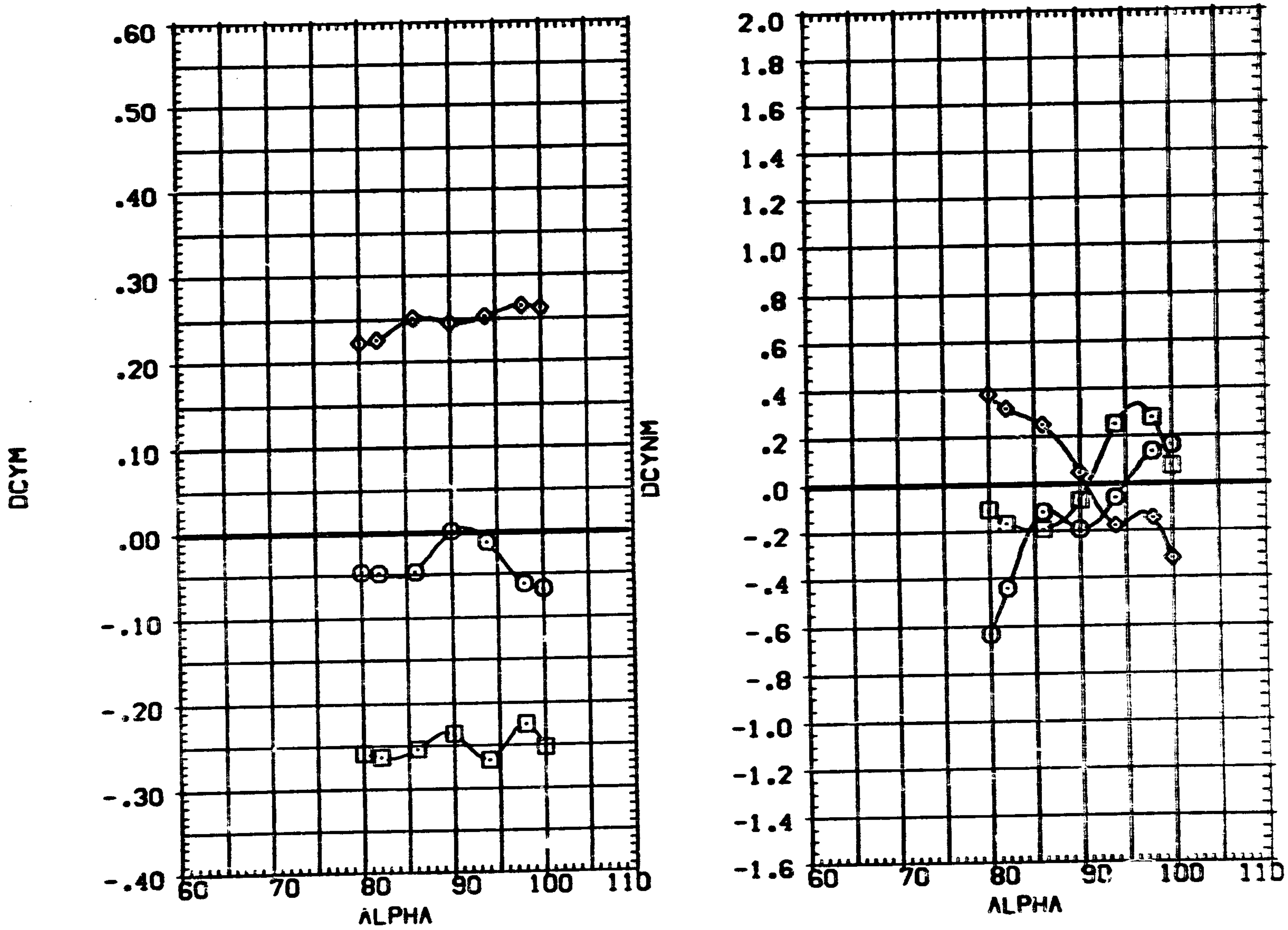


EFFECT OF SEPARATION ROCKET HEIGHT

(A)MACH = .60

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	DSEPRT
(E95018)	○	MSFC 590(SA26F) 142-IN. SRB(139) EFFECT OF S1-S2	.000	45.000	1.000	1.000
(E95019)	□	MSFC 590(SA26F) 142-IN. SRB(139) EFFECT OF S1-S2	.000	90.000	1.000	1.000
(E95020)	◇	MSFC 590(SA26F) 142-IN. SRB(139) EFFECT OF S1-S2	.000	135.000	1.000	1.000

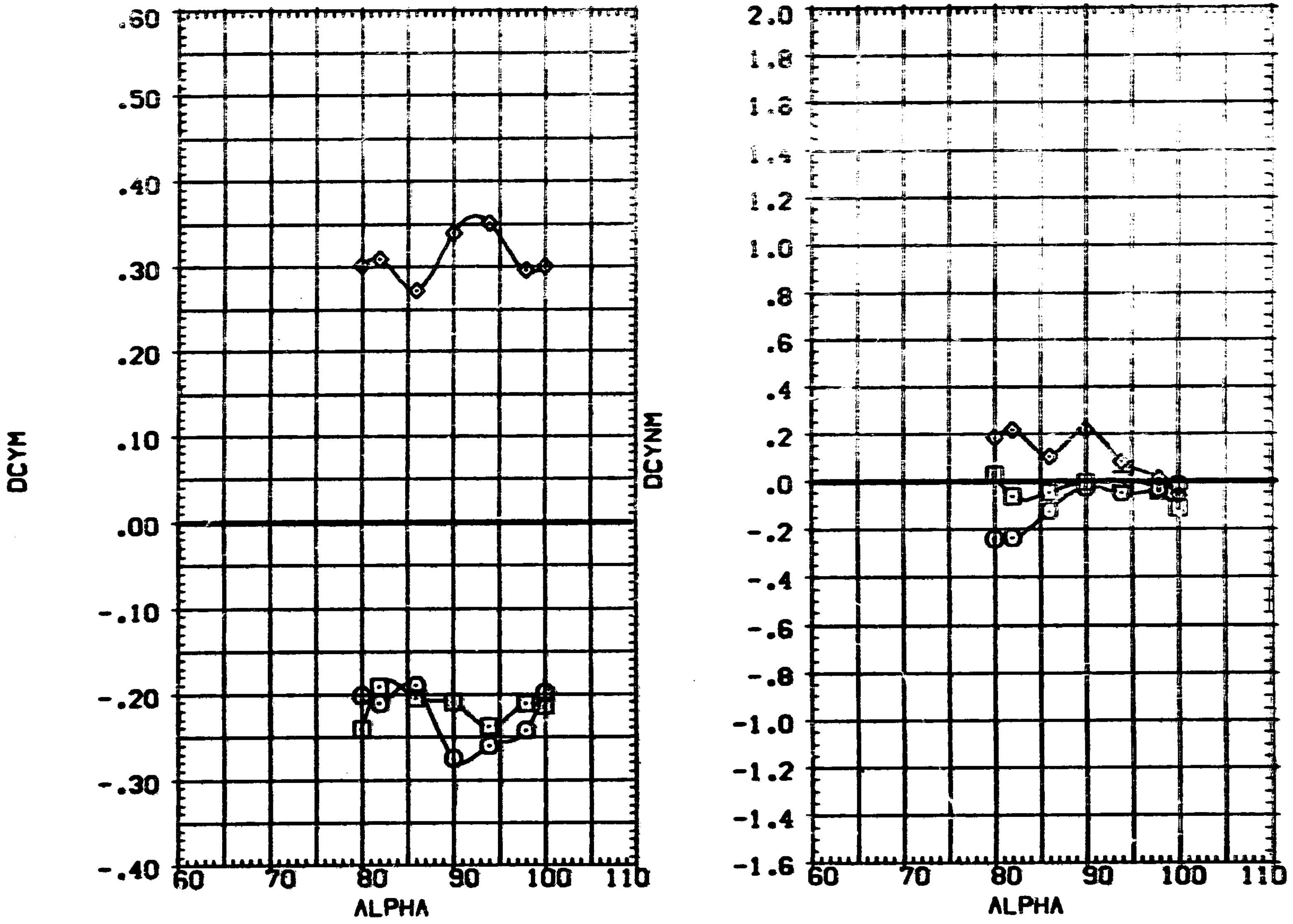
REFERENCE INFORMATION		
SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8030	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	



EFFECT OF SEPARATION ROCKET HEIGHT

(B)MACH = .90

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	DSEPRT	REFERENCE INFORMATION		
(E95018)	○	MSFC 590(SA26F) 142-IN. SRB(139) EFFECT OF SI-S2	.000	45.000	1.000	1.000	SREF	.5030	SQ. IN
(E95019)	□	MSFC 590(SA26F) 142-IN. SRB(139) EFFECT OF SI-S2	.000	90.000	1.000	1.000	LREF	.8000	IN.
(E95020)	◇	MSFC 590(SA26F) 142-IN. SRB(139) EFFECT OF SI-S2	.000	135.000	1.000	1.000	BREF	.8000	IN.
							XMRP	5.5570	IN.
							YMRP	.0000	IN.
							ZMRP	.0000	IN.
							SCALE	.0056	

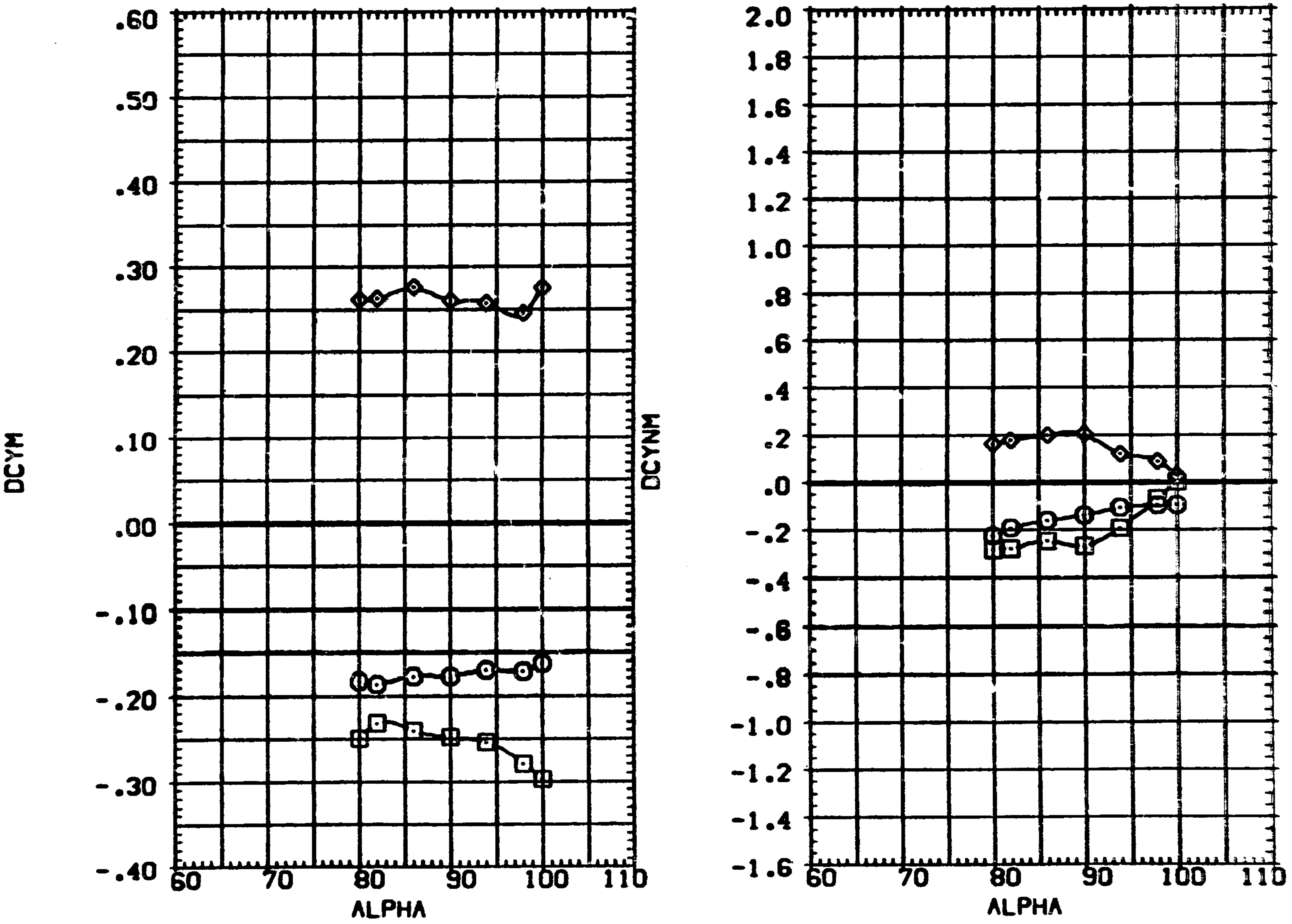


EFFECT OF SEPARATION ROCKET HEIGHT

(C)MACH = 1.20

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	DSEPRT
(E95018)	○	MSFC 580(SA26F) 142-IN. SRB(139) EFFECT OF S1-S2	.000	45.000	1.000	1.000
(E95019)	□	MSFC 580(SA26F) 142-IN. SRB(139) EFFECT OF S1-S2	.000	90.000	1.000	1.000
(E95020)	◇	MSFC 580(SA26F) 142-IN. SRB(139) EFFECT OF S1-S2	.000	135.000	1.000	1.000

REFERENCE INFORMATION		
SREF	.5030	SQ. IN
LREF	.9000	IN.
BREF	.8000	IN.
XMRP	5.5670	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	

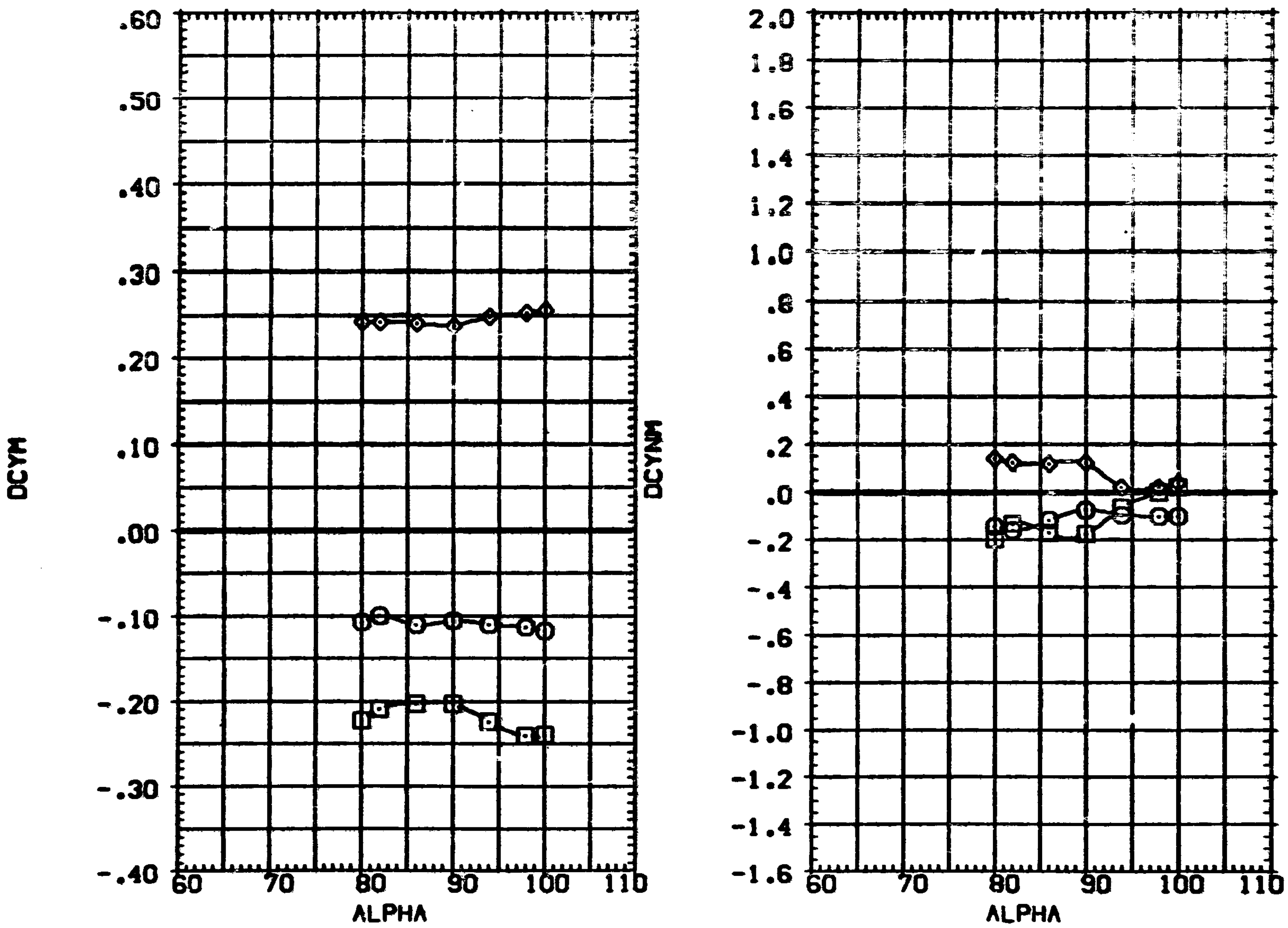


EFFECT OF SEPARATION ROCKET HEIGHT

(D)MACH = 1.96

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	DSEPRT
(E95018)	○	MSFC 580(SA26F) 142-IN. SRB(139) EFFECT OF S1-S2	.000	45.000	1.000	1.000
(E95019)	□	MSFC 580(SA26F) 142-IN. SRB(139) EFFECT OF S1-S2	.000	90.000	1.000	1.000
(E95020)	◇	MSFC 580(SA26F) 142-IN. SRB(139) EFFECT OF S1-S2	.000	135.000	1.000	1.000

REFERENCE INFORMATION		
SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	

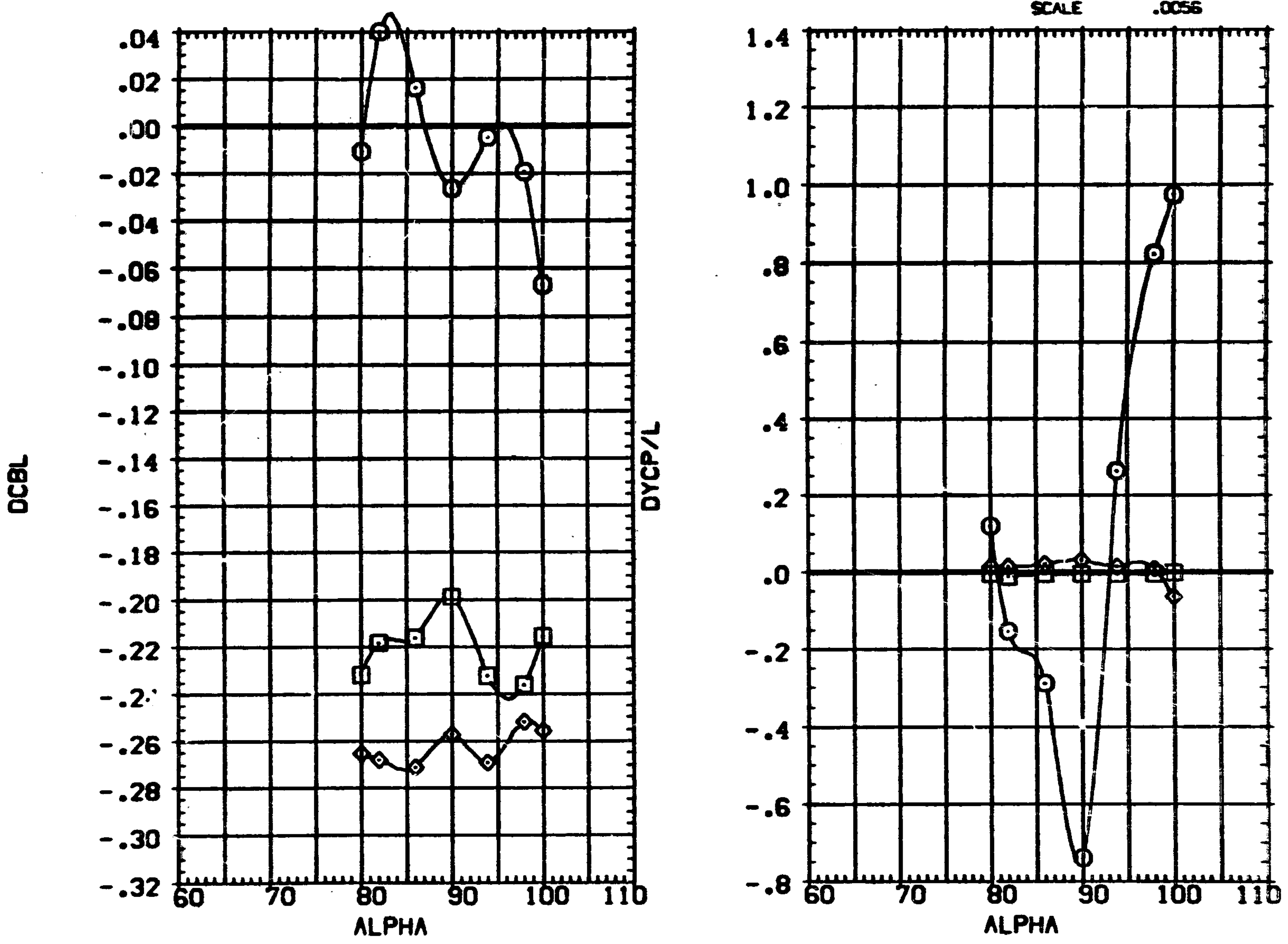


EFFECT OF SEPARATION ROCKET HEIGHT

(E)MACH = 3.48

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	DSEPRT
(ES5018)	○	MSFC 590(SA26F) 142-IN. SRB(139) EFFECT OF SI-S2	.000	45.000	1.000	1.000
(ES5019)	□	MSFC 590(SA26F) 142-IN. SRB(139) EFFECT OF SI-S2	.000	90.000	1.000	1.000
(ES5020)	◇	MSFC 590(SA26F) 142-IN. SRB(139) EFFECT OF SI-S2	.000	135.000	1.000	1.000

REFERENCE INFORMATION		
SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	



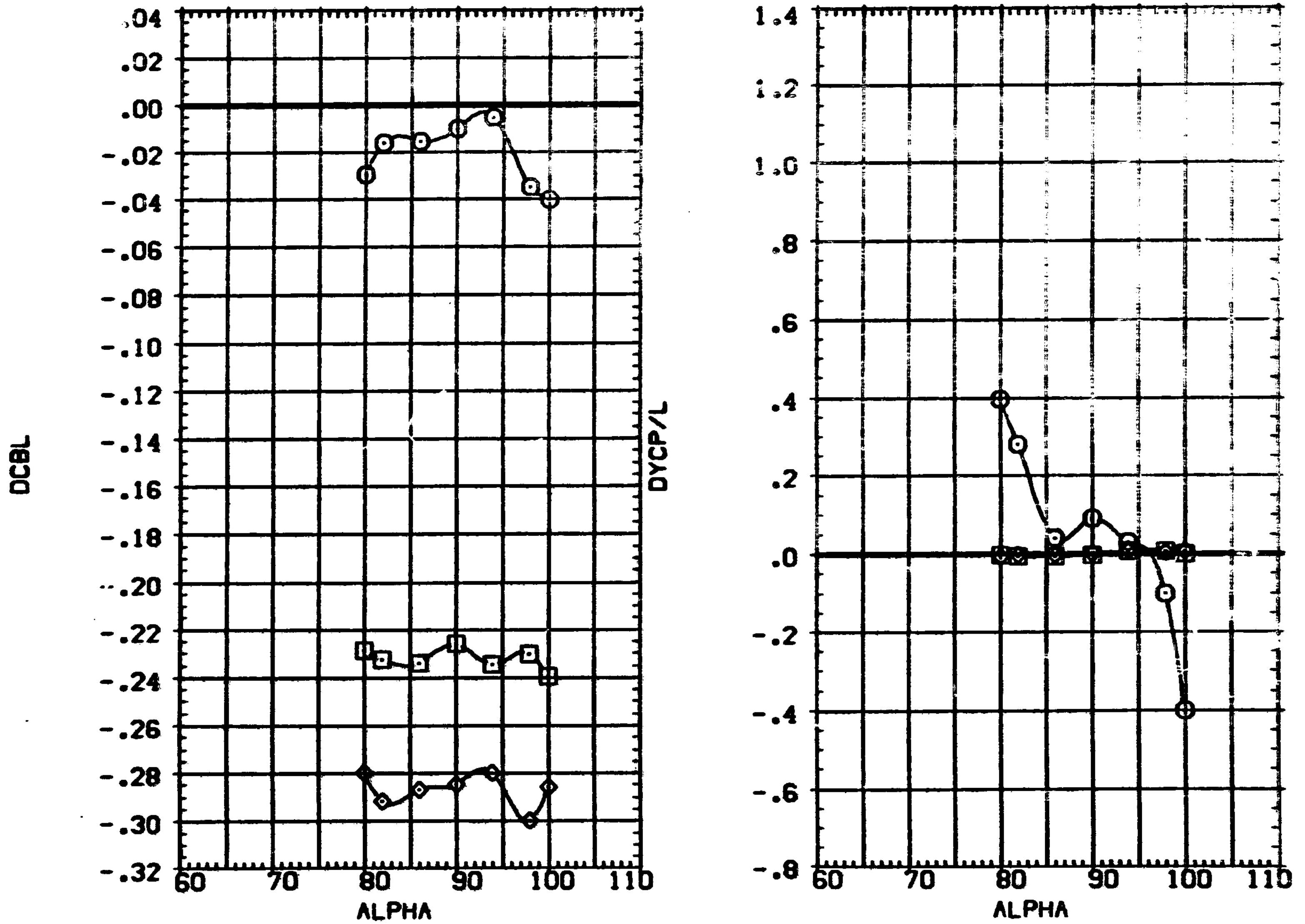
EFFECT OF SEPARATION ROCKET HEIGHT

(A)MACH = .60

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	DSEPRT
(E95018)	○	MSFC 590(SA26F) 142-IN. SRB(139) EFFECT OF S1-S2	.000	45.000	1.000	1.000
(E95019)	□	MSFC 590(SA26F) 142-IN. SRB(139) EFFECT OF S1-S2	.000	90.000	1.000	1.000
(E95020)	◇	MSFC 590(SA26F) 142-IN. SRB(139) EFFECT OF S1-S2	.000	135.000	1.000	1.000

REFERENCE INFORMATION

SREF	.5030	SQ. IN.
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	

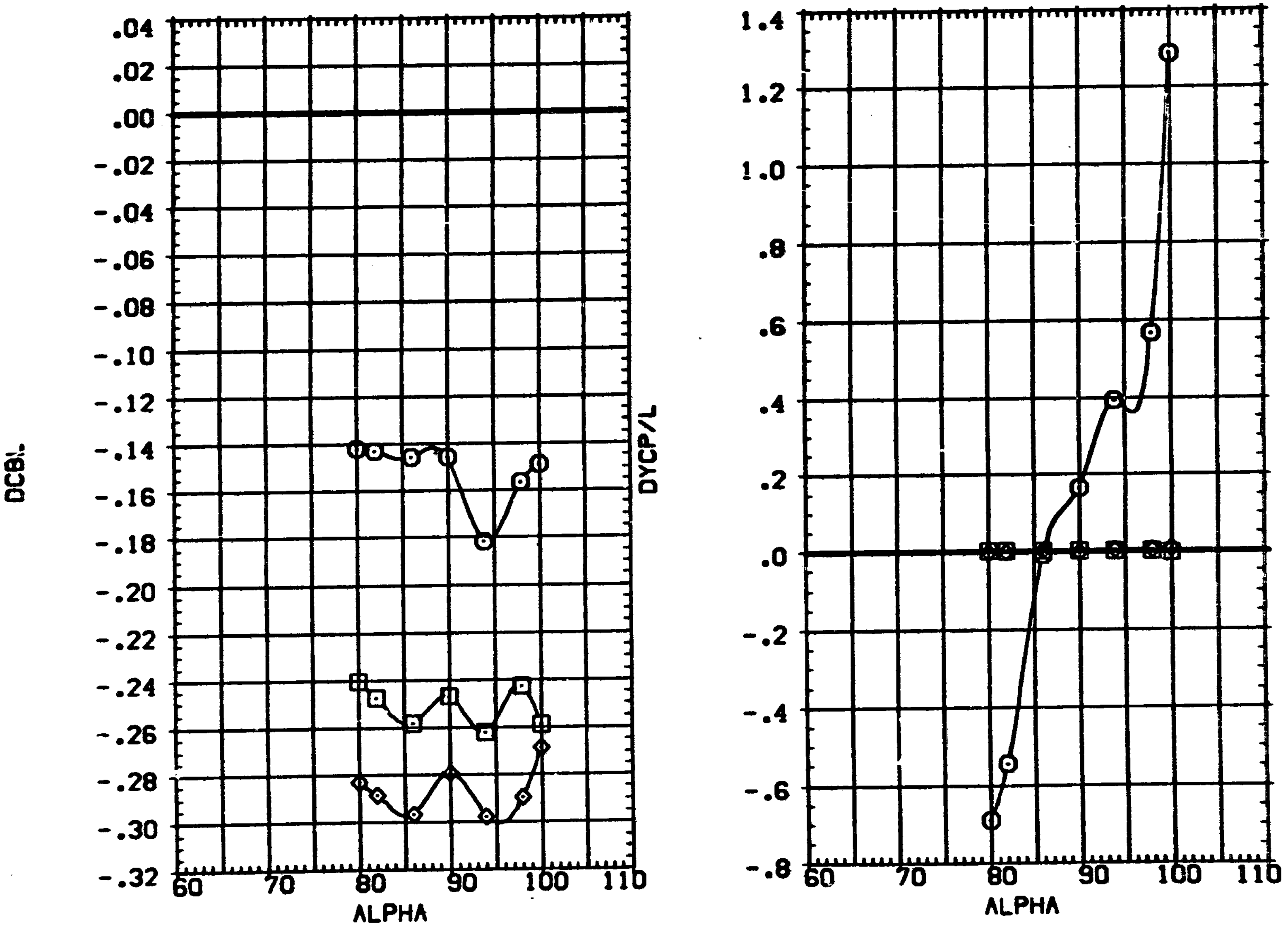


EFFECT OF SEPARATION ROCKET HEIGHT

(B)MACH = .90

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	DSEPRT
(E95018)	○	MSFC 590(SA26F) 142-IN. SRB(139) EFFECT OF S1-S2	.000	45.000	1.000	1.000
(E95019)	□	MSFC 590(SA26F) 142-IN. SRB(139) EFFECT OF S1-S2	.000	90.000	1.000	1.000
(E95020)	◇	MSFC 590(SA26F) 142-IN. SRB(139) EFFECT OF S1-S2	.000	135.000	1.000	1.000

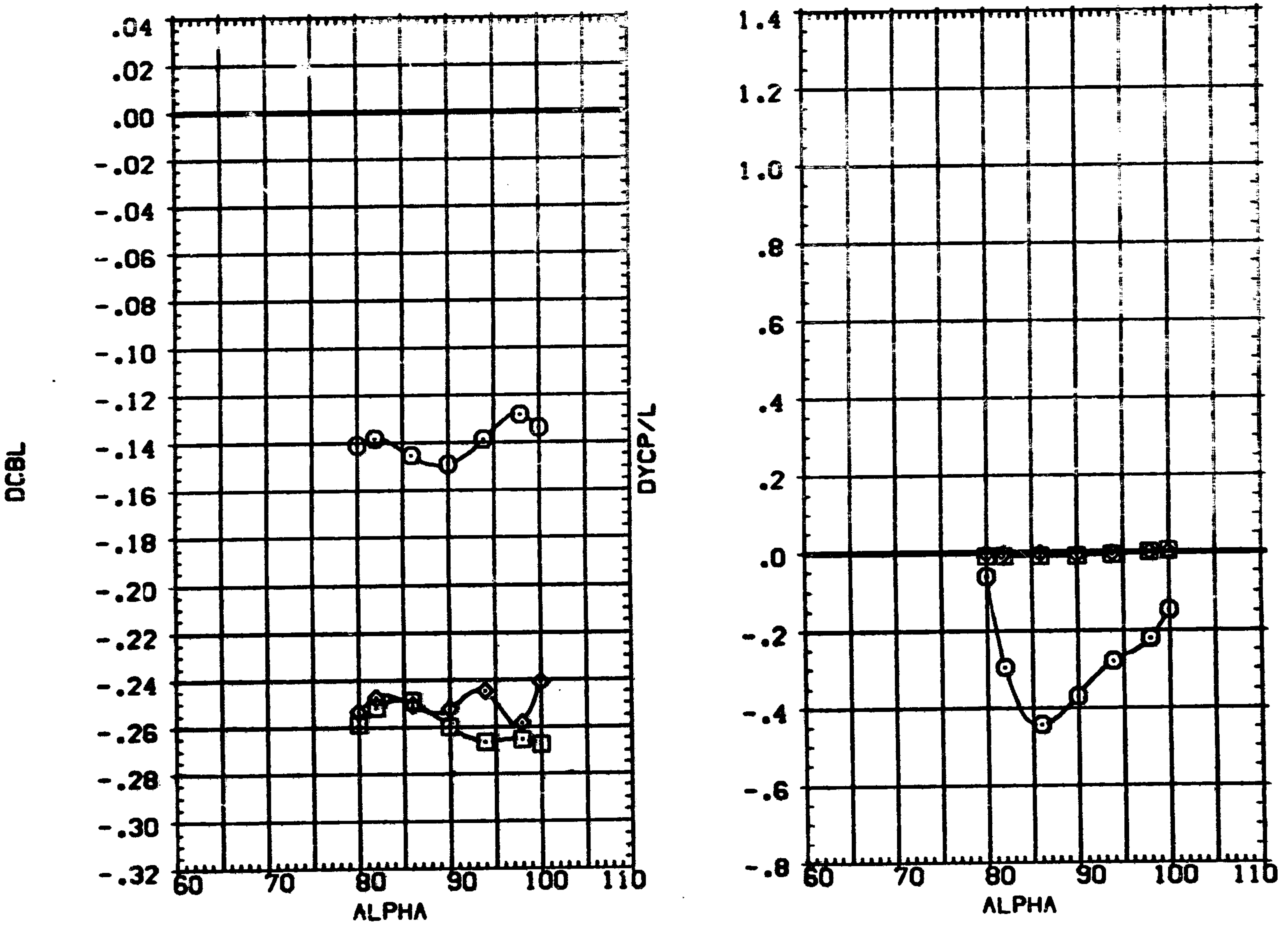
REFERENCE	INFORMATION	
SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	



EFFECT OF SEPARATION ROCKET HEIGHT

(C)MACH = 1.20

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	DSEPRT	REFERENCE INFORMATION		
(E95018)	○	MSFC 580(SA26F) 142-IN. SRB(138) EFFECT OF S1-S2	.000	45.000	1.000	1.000	SREF	.5030	SQ. IN
(E95019)	□	MSFC 580(SA26F) 142-IN. SRB(139) EFFECT OF S1-S2	.000	90.000	1.000	1.000	LREF	.8000	IN.
(E95020)	◇	MSFC 580(SA26F) 142-IN. SRB(139) EFFECT OF S1-S2	.000	135.000	1.000	1.000	BREF	.8000	IN.
							XMRP	5.5570	IN.
							YMRP	.0000	IN.
							ZMRP	.0000	IN.
							SCALE	.0056	



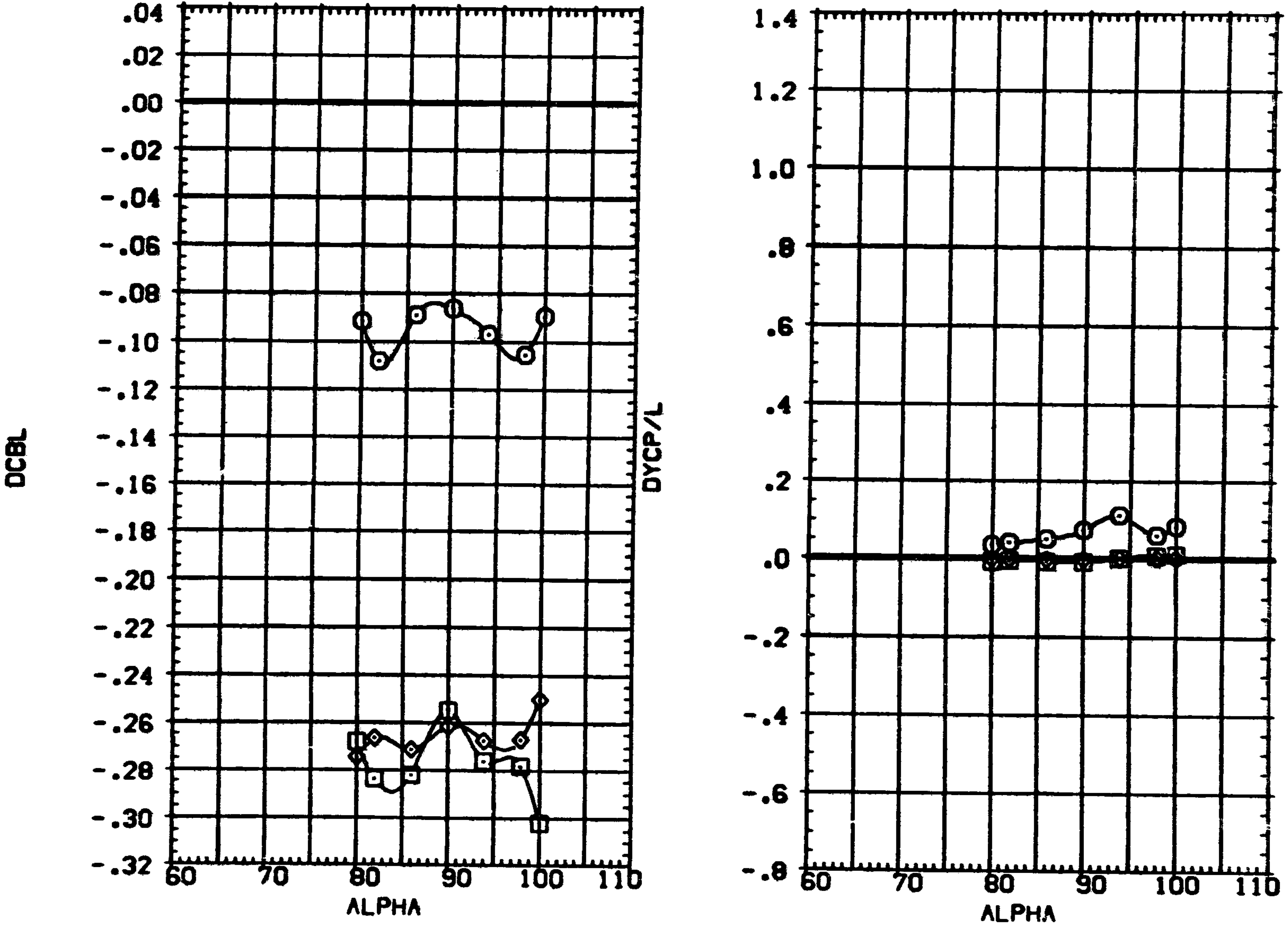
EFFECT OF SEPARATION ROCKET HEIGHT

(D)MACH = 1.96

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	PHI	ELT	DSEPRT
(E95018)	○	MSFC 590(SA26F) 142-IN. SRB(138) EFFECT OF S1-S2	.000	45.000	1.000	1.000
(E95019)	□	MSFC 590(SA26F) 142-IN. SRB(139) EFFECT OF S1-S2	.000	90.000	1.000	1.000
(E95020)	◇	MSFC 590(SA26F) 142-IN. SRB(139) EFFECT OF S1-S2	.000	135.000	1.000	1.000

REFERENCE INFORMATION

SREF	.5030	SQ. IN
LREF	.8000	IN.
BREF	.8000	IN.
XMRP	5.5570	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0056	



EFFECT OF SEPARATION ROCKET HEIGHT
(E)MACH = 3.48

APPENDIX

TABULATED SOURCE DATA

Tabulations of plotted data are available on request from Data Management Services.

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DATE 08 NOV 74                 TABULATED SOURCE DATA,  MSFC TWT 590/595                                  PAGE    1

                                  MSFC 590(SA26F) 142-IN. SRB(139) NBRE1A                        (R95001)   ( 11 DEC 73  )

              REFERENCE DATA                                                                      PARAMETRIC DATA

SREF   =       .5030 SQ. IN   XMRP  =     5.5570 IN.                              BETA   =      .000   PHI    =      .000
LREF   =       .8000 IN.      YMRP  =      .0000 IN.                              FWDSTK =      .000   AFTSTK =      .000
BREF   =       .8000 IN.      ZMRP  =      .0000 IN.                              ATHRNG =     1.000   ATHS   =      .000
SCALE  =       .0038                                                              CONFIG =     1.000   SHDSTK =      .000
                                                                                  ELT    =      .000   SEPRKT =      .000

                           RUN NO.    2/ 0    RN/L =    5.68    GRADIENT INTERVAL =  -5.00/  5.00

  MACH      ALPHA      CNM        CLMM       CYM        CYNM       CBL        CA          CAB        XCP/L      CPB1      CPB2
  4.000    148.390    5.43660     .36620    -.14790    -.05380     .03990   -2.82090     .00000     .56100     .00000    .00000
  4.000    146.450    6.02620     .37430    -.16230    -.04190     .02070   -2.86950     .00000     .56150     .00000    .00000
  4.000    142.300    7.23570     .53920    -.18570    -.01940     .01930   -3.04880     .00000     .56350     .00000    .00000
  4.000    138.230    8.39910    1.29130    -.19530    -.05990     .02170   -3.22630     .00000     .55400     .00000    .00000
  4.000    134.070    9.64310    1.89500    -.21460    -.08100     .02160   -3.07540     .00000     .55050     .00000    .00000
  4.000    129.930   10.95160    2.01510    -.21900    -.09820     .05710   -2.76930     .00000     .55150     .00000    .00000
  4.000    127.930   11.56450    2.06660    -.22890    -.07230     .04160   -2.51440     .00000     .55200     .00000    .00000
  4.000    139.200    8.41000    1.29230    -.19550    -.05300     .02120   -3.22640     .00000     .55400     .00000    .00000
           GRADIENT   -.29865    -.09639     .00372     .00242    -.00597    -.00772     .00000     .00057     .00000    .00000

                           RUN NO.    3/ 0    RN/L =    5.24    GRADIENT INTERVAL =  -5.00/  5.00

  MACH      ALPHA      CNM        CLMM       CYM        CYNM       CBL        CA          CAB        XCP/L      CPB1      CPB2
  4.450    149.560    5.05910     .65990    -.13650    -.06530     .02090   -2.62670     .00000     .55590     .00000    .00000
  4.450    146.630    5.64620     .72860    -.14730    -.05950     .02040   -2.69160     .00000     .55600     .00000    .00000
  4.450    142.510    6.82940     .96670    -.16850    -.07230     .04540   -2.87220     .00000     .55500     .00000    .00000
  4.450    138.440    7.90220    1.77350    -.17070    -.09690     .04620   -3.07700     .00000     .54920     .00000    .00000
  4.450    134.330    9.12660    2.35480    -.19870    -.12250     .02360   -2.93340     .00000     .54550     .00000    .00000
  4.450    130.230   10.39530    2.45730    -.20800    -.12600     .05270   -2.65250     .00000     .54720     .00000    .00000
  4.450    128.280   11.00720    2.50770    -.21300    -.09320     .01730   -2.51020     .00000     .54790     .00000    .00000
  4.450    138.440    7.87700    1.75500    -.17610    -.13200     .03740   -3.07320     .00000     .54840     .00000    .00000
           GRADIENT   -.29085    -.10331     .00374     .00274    -.00037    -.00315     .00000     .00351     .00000    .00000

                           RUN NO.    4/ 0    RN/L =    4.92    GRADIENT INTERVAL =  -5.00/  5.00

  MACH      ALPHA      CNM        CLMM       CYM        CYNM       CBL        CA          CAB        XCP/L      CPB1      CPB2
  4.960    148.670    5.11780    1.11270    -.15500    -.00710     .01670   -2.68200     .00000     .54890     .00000    .00000
  4.960    146.750    5.67710    1.14510    -.15060    -.01950    -.00380   -2.72450     .00000     .55010     .00000    .00000
  4.960    142.680    6.89160    1.46600    -.17630    -.02430     .05960   -2.92490     .00000     .54920     .00000    .00000
  4.960    138.600    8.06630    2.18020    -.18580    -.03160     .04900   -3.12230     .00000     .54450     .00000    .00000
  4.950    134.510    9.29160    2.96010    -.21090    -.11030     .05450   -3.07930     .00000     .54050     .00000    .00000
  4.960    130.430   10.59560    3.24970    -.22010    -.13880     .04360   -2.79630     .00000     .54150     .00000    .00000
  4.960    128.490   11.23290    3.30300    -.22480    -.14090     .02160   -2.63630     .00000     .54250     .00000    .00000
  4.960    138.600    8.04710    2.10750    -.18490    -.06570     .05200   -3.13060     .00000     .54520     .00000    .00000
           GRADIENT   -.30160    -.12259     .00382     .00723    -.00112     .00201     .00000     .00346     .00000    .00000
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                                MSFC 590(SA26F) 142-IN. SRB(139) NBRE1A                (R95002)   ( 11 DEC 73

              REFERENCE DATA                                                                          PARAMETRIC DATA

SREF  =      .5030 SQ. IN   XMRP  =     5.5570 IN.                                  BETA   =     .000  PHI    =     .000
LREF  =      .8000 IN.      YMRP  =      .0000 IN.                                  FWDSTK =     .000  AFTSTK =     .000
BREF  =      .8000 IN.      ZMRP  =      .0000 IN.                                  ATHRNG =    1.000  ATHS   =     .000
SCALE =      .0036                                                                  CONFIG =    1.000  SHDSTK =     .000
                                                                                    ELT    =     .000  SEPRKT =     .000

                          RUN NO.    1/ 1    RN/L =   6.29    GRADIENT INTERVAL =  -5.00/  5.00

   MACH      ALPHA      CNM       CLMM       CYM       CYNM       CBL       CA         CAB       XCP/L      CPB1      CPB2
  3.480    148.180   5.48830   1.38750   -.17130   -.05020   .03870  -3.60010    .00000    .54590    .00000    .00000
  3.480    146.140   6.25250    .30580   -.18270   -.05170   .03680  -2.95780    .00000    .56250    .00000    .00000
  3.480    141.970   7.52290    .53340   -.20310   -.06660   .02420  -3.11300    .00000    .56970    .00000    .00000
  3.480    137.810   8.69150   1.13180   -.22030   -.04660   .04050  -3.24600    .00000    .55590    .00000    .00000
  3.480    133.660   9.91050   1.72340   -.23760   -.03250   .03260  -3.07640    .00000    .55230    .00000    .00000
  3.480    129.470  11.22310   1.81930   -.25040   -.06250   .03260  -2.76750    .00000    .55330    .00000    .00000
  3.480    127.470  11.82630   1.88970   -.25060   -.09030   .03330  -2.60620    .00000    .55350    .00000    .00000
  3.480    129.450  11.22300   1.83970   -.24640   -.07800   .03370  -2.76630    .00000    .55320    .00000    .00000
  3.480    133.640   9.90220   1.70190   -.23010   -.03180   .04610  -3.07430    .00000    .55250    .00000    .00000
  3.480    137.800   8.70070   1.10140   -.22010   -.05680   .04610  -3.23940    .00000    .55625    .00000    .00000
  3.480    141.940   7.53300    .46130   -.19600   -.05000   .03640  -3.11150    .00000    .56150    .00000    .00000
  3.480    146.120   6.28240    .23710   -.17990   -.00980   .01440  -2.93550    .00000    .56350    .00000    .00000
  3.480    148.100   5.66650    .14890   -.17150   -.01300   .01490  -2.87790    .00000    .56440    .00000    .00000
           GRADIENT  -.29878   -.07740    .00401    .00186  -.00057   -.01829    .00000    .00036    .00000    .00000
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DATE 08 NOV 74                 TABULATED SOURCE DATA.  MSFC TWT 590/595                                PAGE    3

                                 MSFC 590(SA26F) 142-IN. SRB(139) NBRE1A                     (R95003)   ( 11 DEC 73  )

             REFERENCE DATA                                                                  PARAMETRIC DATA

SREF  =     .3030 SQ. IN   XMRP  =     5.5570 IN.                            BETA   =      .000  PHI    =     .000
LREF  =     .0000 IN.      YMRP  =      .0000 IN.                            FWDSTR =      .000  AFTSTR =     .000
BREF  =     .0000 IN.      ZMRP  =      .0000 IN.                            ATHRNG =     1.000   THS   =     .000
SCALE =     .0036                                                            CONFIG =     1.000  SHDSTR =     .000
                                                                             ELT    =      .000  SEPRKT =     .000

                       RUN NO.   19/ 0    RN/L =   5.76    GRADIENT INTERVAL =  -5.00/  5.00

  MACH     ALPHA      CNM       CLMM       CYM       CYNM       CBL       CA         CAB       XCP/L      CPB1      CPB2
 4.000   169.830    .63940    .04890   -.04900   -.01920    .01610  -2.32900    .00000    .55030    .00000    .00000
 4.000   167.910    .85320    .22480   -.05550   -.03500    .00520  -2.39290    .00000    .54330    .00000    .00000
 4.000   165.870   1.25290    .41250   -.07440    .01590    .00130  -2.46820    .00000    .53970    .00000    .00000
 4.000   163.840   1.63130    .59410   -.08720    .01440   -.00590  -2.54610    .00000    .53730    .00000    .00000
 4.000   159.750   2.51920    .95340   -.10390    .00350    .01620  -2.73760    .00000    .53730    .00000    .00000
 4.000   157.680   3.04110    .98310   -.10750   -.00450    .01730  -2.89320    .00000    .54020    .00000    .00000
 4.000   153.580   4.13190   1.09760   -.12530   -.01430    .00870  -3.22290    .00000    .54490    .00000    .00000
 4.000   149.520   5.33070    .30700   -.14840    .01530    .01560  -2.82540    .00000    .56150    .00000    .00000
 4.000   159.750   2.30850    .87510   -.10880    .01710   -.00390  -2.75820    .00000    .53910    .00000    .00000
         GRADIENT  -.23170   -.02997    .00477   -.00104   -.00538    .03642    .00000   -.00319    .00000    .00000

                       RUN NO.   18/ 0    RN/L =   5.43    GRADIENT INTERVAL =  -5.00/  5.00

  MACH     ALPHA      CNM       CLMM       CYM       CYNM       CBL       CA         CAB       XCP/L      CPB1      CPB2
 4.450   169.850    .56970    .10140   -.04260    .03580    .00250  -2.21740    .00000    .55200    .00000    .00000
 4.450   167.930    .80920    .30290   -.05530   -.06230    .01150  -2.29400    .00000    .53500    .00000    .00000
 4.450   165.920   1.15630    .56250   -.05750   -.07350    .02010  -2.35040    .00000    .52510    .00000    .00000
 4.450   163.890   1.40540    .77340   -.06750   -.03270    .00910  -2.43710    .00000    .52350    .00000    .00000
 4.450   159.820   2.33450   1.07960   -.10020    .01440   -.00990  -2.54140    .00000    .52390    .00000    .00000
 4.450   157.780   2.81590   1.13520   -.10360    .00490    .00000  -2.78070    .00000    .53350    .00000    .00000
 4.450   153.670   3.89930   1.26490   -.11700   -.04090    .02070  -3.14910    .00000    .54010    .00000    .00000
 4.450   149.670   5.09410    .44710   -.13940    .03090   -.01900  -2.75520    .00000    .55940    .00000    .00000
 4.450   159.830   2.30580   1.05090   -.09750    .01520   -.01750  -2.64190    .00000    .52900    .00000    .00000
         GRADIENT  -.22292   -.03397    .00476   -.00192    .00099    .03722    .00000   -.00262    .00000    .00000

                       RUN NO.   17/ 0    RN/L =   4.98    GRADIENT INTERVAL =  -5.00/  5.00

  MACH     ALPHA      CNM       CLMM       CYM       CYNM       CBL       CA         CAB       XCP/L      CPB1      CPB2
 4.960   169.850    .54440    .10260   -.04650    .03560    .00040  -2.24700    .00000    .55110    .00000    .00000
 4.960   167.930    .74220    .32080   -.03580   -.00150    .01440  -2.30310    .00000    .53130    .00000    .00000
 4.960   165.940   1.03940    .56790   -.06590   -.05070    .00950  -2.37610    .00000    .52290    .00000    .00000
 4.960   163.920   1.43590    .88760   -.06800   -.10010    .01240  -2.46060    .00000    .51610    .00000    .00000
 4.960   159.870   2.27390   1.23020   -.10040   -.05900    .02110  -2.69000    .00000    .52240    .00000    .00000
 4.960   157.820   2.77330   1.32060   -.10410   -.06020    .02140  -2.84390    .00000    .52770    .00000    .00000
 4.960   153.770   3.85650   1.41030   -.12120   -.01600    .03040  -3.23310    .00000    .53670    .00000    .00000
 4.960   149.790   5.09110    .56970   -.14600   -.00200    .01690  -2.77540    .00000    .55740    .00000    .00000
 4.960   159.890   2.23410   1.22450   -.08300   -.08110    .00110  -2.70910    .00000    .52190    .00000    .00000
         GRADIENT  -.22543   -.04229    .00498    .00069   -.00132    .04063    .00000   -.00362    .00000    .00000
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DATE 08 NOV 74                    TABULATED SOURCE DATA,  MSFC TWT 590/593                                 PAGE    4

                                  MSFC 590(SA26F) 142-IN. SRB(139) NBREIA                       (R95DC4)   ( 11 DEC 73 )

            REFERENCE DATA                                                                         PARAMETRIC DATA

SREF  =     .3030 SQ. IN   XMRP  =    5.5570 IN.                                    BETA   =     .000   PHI    =     .000
LREF  =     .8000 IN.      YMRP  =     .0000 IN.                                    FLOSTK =     .000   AFTSTK =     .000
BREF  =     .8000 IN.      ZMRP  =     .0000 IN.                                    ATHRNG =    1.000   ATHS   =     .000
SCALE =     .0038                                                                   CONFIG =    1.000   SHOSTK =     .000
                                                                                    ELT    =     .000   SEPRKT =     .000

                         RUN NO.   20/ 0    RN/L =   6.30    GRADIENT INTERVAL =  -5.00/  5.00

  MACH      ALPHA      CNM       CLMM       CYM       CYNM       CBL       CA        CAS       XCP/L      CPB1      CPB2
  3.480    169.790    .69140   -.17910   -.06520    .03820    .00780  -2.35110    .00000    .59770    .00000    .00000
  3.480    167.830   1.00180    .02350   -.07490    .02550    .01390  -2.42310    .00000    .56460    .00000    .00000
  3.480    165.810   1.36600    .17710   -.09210   -.00290    .00780  -2.45990    .00000    .55500    .00000    .00000
  3.480    163.760   1.75600    .36380   -.10980   -.01600    .00510  -2.57790    .00000    .54960    .00000    .00000
  3.480    159.640   2.67330    .62880   -.11760    .02200    .01570  -2.77570    .00000    .54730    .00000    .00000
  3.480    157.560   3.19040    .67460   -.12500    .01560    .01660  -2.89220    .00000    .54930    .00000    .00000
  3.480    153.430   4.28680    .82840   -.13670    .00250    .00420  -3.18170    .00000    .55090    .00000    .00000
  3.480    149.370   5.39060   1.20440   -.15240   -.01170    .02050  -3.39170    .00000    .54930    .00000    .00000
  3.480    153.410   4.29780    .80800   -.13670   -.00240    .00470  -3.18710    .00000    .55120    .00000    .00000
  3.480    157.570   3.17290    .67380   -.12900    .03630    .02910  -2.89960    .00000    .54920    .00000    .00000
  3.480    159.540   2.65690    .61730   -.11770    .03250    .01490  -2.78260    .00000    .54760    .00000    .00000
  3.490    163.760   1.73840    .33050   -.11300   -.03660    .00250  -2.38600    .00000    .55100    .00000    .00000
  3.490    165.790   1.36530    .18580   -.09900   -.03430    .00540  -2.51520    .00000    .55540    .00000    .00000
  3.490    167.850    .99170    .02060   -.08100   -.04200    .00620  -2.43270    .00000    .55490    .00000    .00000
  3.480    169.790    .70310   -.18390   -.06080    .00230    .00630  -2.35940    .00000    .59750    .00000    .00000
          GRADIENT   -.22710   -.05215    .03415   -.00037   -.00346    .05469    .00000    .00149    .00000    .00000
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MSFC 593(8428P) 148-IN. SRB(153) NBRE1A (RB9005) (11 DEC 73)

REFERENCE DATA

SREF = .9030 SQ. IN XMRP = 5.5570 IN.
LREF = .8000 IN. YMRP = .0000 IN.
BREF = .8000 IN. ZMRP = .0000 IN.
SCALE = .0036

PARAMETRIC DATA

BETA = .000 PHI = .000
FWDSTK = .000 AFTSTK = .000
ATHRNG = 1.000 ETMS = .000
CONFIG = 1.000 SHDSTK = .000
ELT = .000 SEPRAT = .000

RUN NO. 7/ 0 RN/L = 6.25 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CPB1	CPB2
3.480	190.330	-.65110	-.29930	-.05890	.03120	.00080	-2.37640	.00000	.52900	.00000	.00000
3.480	188.400	-.38650	-.11250	-.04240	.03020	.00350	-2.32690	.00000	.54230	.00000	.00000
3.480	186.360	-.21140	.08010	-.02550	.03950	.00030	-2.25450	.00000	.59750	.00000	.00000
3.480	185.350	-.14940	.08630	-.02640	.03990	.00350	-2.24220	.00000	.61350	.00000	.00000
3.480	184.340	-.10530	.07000	-.02670	.03990	-.00590	-2.21720	.00000	.62590	.00000	.00000
3.480	183.340	-.07910	.06390	-.02690	.06530	.00750	-2.19490	.00000	.63250	.00000	.00000
3.480	182.850	-.06140	.04480	-.02690	.03990	.00325	-2.17450	.00000	.62510	.00000	.00000
3.480	182.330	-.04340	.01570	-.02340	.06550	.00710	-2.15590	.00000	.59510	.00000	.00000
3.480	181.820	-.00740	-.03320	-.02390	.07620	.00620	-2.15370	.00000	.20490	.00000	.00000
3.480	181.320	-.00750	-.04340	-.02360	.06590	.00790	-2.14590	.00000	.59730	.00000	.00000
3.480	180.820	.00140	-.06370	-.02350	.06090	.01290	-2.14330	.00000	-.25490	.00000	.00000
3.480	180.310	.03580	-.15400	-.02030	.07230	-.00290	-2.14410	.00000	.79130	.00000	.00000
3.480	183.330	-.06350	.02170	-.01940	.03540	-.00135	-2.19910	.00000	.55590	.00000	.00000
	GRADIENT	-.06177	-.01174	-.00307	-.00440	-.00020	-.02431	.00000	-.09717	.00000	.00000

RUN NO. 11/ 0 RN/L = 5.70 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CPB1	CPB2
4.000	190.290	-.58570	-.50190	-.05470	.00730	.01340	-2.34300	.00000	.49590	.00000	.00000
4.000	188.370	-.34010	-.30150	-.04720	.02610	-.00490	-2.29590	.00000	.49420	.00000	.00000
4.000	186.340	-.17750	-.05220	-.03360	.01550	.00700	-2.23690	.00000	.54210	.00000	.00000
4.000	185.340	-.14260	-.02050	-.02910	.01750	.01210	-2.21440	.00000	.55490	.00000	.00000
4.000	184.330	-.08410	-.01370	-.03510	.03130	.00320	-2.19780	.00000	.55320	.00000	.00000
4.000	183.350	-.04860	-.03780	-.03370	.06530	-.01570	-2.17050	.00000	.53330	.00000	.00000
4.000	182.850	-.03670	-.05540	-.02550	.05200	.00950	-2.15850	.00000	.45440	.00000	.00000
4.000	182.330	-.02550	-.04850	-.03550	.05140	.00290	-2.14700	.00000	.41130	.00000	.00000
4.000	181.820	-.00150	-.11630	-.03550	.04540	.00940	-2.14410	.00000	-8.45330	.00000	.00000
4.000	181.310	.04690	-.16890	-.02090	.04620	-.00990	-2.13770	.00000	.86330	.00000	.00000
4.000	180.810	.04670	-.19610	-.03030	.02530	.01110	-2.13330	.00000	.92950	.00000	.00000
4.000	180.310	.05920	-.23710	-.02560	.03290	.00400	-2.13490	.00000	.99320	.00000	.00000
4.000	183.330	-.05060	-.01050	-.03070	.07200	.00100	-2.16850	.00000	.55240	.00000	.00000
	GRADIENT	-.05872	-.02263	-.00259	-.00364	.00327	-.02189	.00000	.14425	.00000	.00000

MSFC 590(SA26F) 142-IN. SRB(139) NBRE1A (R93055) (11 DEC 73)

REFERENCE DATA

SREF = .5030 SQ. IN XMRP = 5.5570 IN.
LREF = .8000 IN. YMRP = .0000 IN.
BREF = .8000 IN. ZMRP = .0000 IN.
SCALE = .0056

PARAMETRIC DATA

BETA = .000 PHI = .000
FWDSTK = .000 AFTSTK = .000
ATHENG = 1.000 ATHS = .000
CONFIG = 1.000 SHOSTK = .000
ELT = .000 SEPRAT = .000

RUN NO. 13/ 0 RN/L = 5.34 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CPB1	CPB2
4.450	190.280	-.51820	-.49470	-.03980	.01650	-.00150	-2.20820	.00000	.49970	.00000	.00000
4.450	188.360	-.29720	-.26210	-.05640	.12610	-.01070	-2.14600	.00000	.49460	.00000	.00000
4.450	186.340	-.18020	-.05980	-.05670	.08940	.00740	-2.11130	.00000	.53950	.00000	.00000
4.450	185.330	-.13470	-.07500	-.03820	.08170	-.00100	-2.10690	.00000	.52110	.00000	.00000
4.450	184.330	-.07570	-.03660	-.01840	.00410	-.00390	-2.07590	.00000	.52710	.00000	.00000
4.450	183.330	-.04540	-.06980	-.01200	-.01260	.00490	-2.05940	.00000	.44130	.00000	.00000
4.450	182.320	-.03070	-.10170	-.02500	.01280	-.00420	-2.05370	.00000	.29570	.00000	.00000
4.450	181.320	-.01520	-.15190	-.01920	.03100	.05940	-2.03950	.00000	-.24650	.00000	.00000
4.450	180.820	.04470	-.18250	-.02590	.03090	.00990	-2.03340	.00000	.99940	.00000	.00000
4.450	180.310	.07470	-.19730	-.03290	.06520	-.00930	-2.03630	.00000	.79170	.00000	.00000
4.450	183.330	-.04650	.00490	-.03900	.09960	.02915	-2.05740	.00000	.57520	.00000	.00000
	GRADIENT	-.05206	-.02264	-.00286	.00377	-.00059	-.01677	.00000	.00091	.00000	.00000

RUN NO. 15/ 0 RN/L = 4.88 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CPB1	CPB2
4.959	190.260	-.44470	-.63670	-.03850	.04370	-.00880	-2.23930	.00000	.44970	.00000	.00000
4.959	189.360	-.31010	-.32200	-.03820	-.04000	.01810	-2.17420	.00000	.49190	.00000	.00000
4.959	186.330	-.11220	-.23490	-.04130	.03950	.00650	-2.14190	.00000	.39570	.00000	.00000
4.959	185.330	-.09240	-.21090	-.03330	.02810	.00090	-2.14000	.00000	.39040	.00000	.00000
4.959	184.320	-.03220	-.22810	-.02620	.08630	-.00460	-2.12770	.00000	-.01560	.00000	.00000
4.959	183.320	-.03300	-.18150	-.02530	.03990	.04370	-2.10920	.00000	.12020	.00000	.00000
4.959	182.840	-.03310	-.20420	-.02550	.05140	-.00180	-2.15640	.00000	.06330	.00000	.00000
4.959	182.320	-.03360	-.18160	-.02470	.00550	.00200	-2.10040	.00000	.12650	.00000	.00000
4.959	181.820	.04590	-.15270	-.01720	.01650	.00330	-2.09440	.00000	.83920	.00000	.00000
4.959	181.320	.04600	-.22330	-.02460	-.02930	-.00550	-2.09570	.00000	.96250	.00000	.00000
4.959	180.820	.05640	-.24620	-.00760	-.05140	-.00490	-2.09740	.00000	.85990	.00000	.00000
4.959	180.320	.06360	-.17750	-.00700	-.09560	.00840	-2.09570	.00000	.78550	.00000	.00000
4.959	183.320	-.03590	-.20450	-.04990	.01540	-.00740	-2.10900	.00000	.37490	.00000	.00000
	GRADIENT	-.04862	-.03249	-.00299	.00648	.00003	-.01409	.00000	-.03375	.00000	.00000

MSFC 590(SA26F) 142-In. SRB,139) NBRE1A (P05006) (11 DEC 73)

REFERENCE DATA

SREF = .5030 SQ. IN XMRP = 5.5570 IN.
LREF = .8000 IN. YMRP = .0000 IN.
BREF = .8000 IN. ZMRP = .0000 IN.
SCALE = .0056

PARAMETRIC DATA

BETA = .000 PHI = .000
FWDSTK = .000 AFTSTK = .000
ATHRNG = 1.000 ATHS = .000
CONFIG = 1.000 SHDSTK = .000
ELT = .000 SEPRKT = .000

RUN NO. 6/ 0 RN/L = 6.32 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CPB1	CPB2
3.480	180.310	.04810	-.11220	-.02750	.06100	.00300	-2.13670	.00000	.76490	.00000	.00000
3.480	179.813	.06490	-.18450	-.02000	.05680	.00760	-2.13770	.00000	.79930	.00000	.00000
3.480	179.310	.06520	-.20550	-.02010	.05210	.00720	-2.14060	.00000	.82340	.00000	.00000
3.480	178.800	.09240	-.26580	-.02810	.08270	-.00320	-2.14430	.00000	.80190	.00000	.00000
3.480	178.300	.11090	-.29690	-.02030	.06280	.01660	-2.14930	.00000	.73490	.00000	.00000
3.480	177.790	.12910	-.31750	-.02030	.05780	.02170	-2.16310	.00000	.76710	.00000	.00000
3.480	177.290	.13830	-.33850	-.02420	.06290	.00770	-2.17190	.00000	.76510	.00000	.00000
3.480	176.260	.19270	-.40980	-.02040	.04300	.00920	-2.19900	.00000	.73390	.00000	.00000
3.480	175.270	.22960	-.49210	-.02080	.05390	.00380	-2.20930	.00000	.74130	.00000	.00000
3.480	174.220	.26590	-.51310	-.02050	.02820	.00610	-2.23120	.00000	.72330	.00000	.00000
3.480	172.220	.41780	-.46630	-.02500	.00690	.01300	-2.29140	.00000	.65760	.00000	.00000
3.480	170.300	.62970	-.20690	-.04170	.00370	.00940	-2.36360	.00000	.59330	.00000	.00000
3.480	177.290	.14740	-.35930	-.02060	.05840	.00700	-2.16590	.00000	.76490	.00000	.00000
	GRADIENT	-.05351	.02121	.00108	.00695	-.00035	.02223	.00000	.01942	.00000	.00000

RUN NO. 12/ 0 RN/L = 5.67 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CPB1	CPB2
4.000	180.310	.05850	-.19450	-.02590	.03930	.00330	-2.12270	.00000	.83760	.00000	.00000
4.000	179.810	.09440	-.24810	-.03070	.02560	-.00120	-2.12600	.00000	.78080	.00000	.00000
4.000	179.310	.09460	-.24810	-.02570	.02590	.01070	-2.12550	.00000	.78040	.00000	.00000
4.000	178.800	.10690	-.27420	-.03150	.06700	.00760	-2.13140	.00000	.77590	.00000	.00000
4.000	178.300	.11880	-.28690	-.03690	.08740	.00000	-2.13550	.00000	.76350	.00000	.00000
4.000	177.780	.14300	-.31390	-.03700	.09760	.00010	-2.14520	.00000	.74530	.00000	.00000
4.000	177.300	.15520	-.32780	-.03190	.07430	.00710	-2.15120	.00000	.73590	.00000	.00000
4.000	176.300	.14420	-.34570	-.02620	.04050	.00980	-2.18090	.00000	.76210	.00000	.00000
4.000	175.290	.22770	-.36930	-.03210	.06090	.00230	-2.20710	.00000	.69990	.00000	.00000
4.000	174.240	.27570	-.35490	-.03260	.06760	-.00420	-2.24360	.00000	.67150	.00000	.00000
4.000	172.260	.38130	-.19840	-.04850	.07230	.00960	-2.29340	.00000	.60950	.00000	.00000
4.000	170.340	.60490	-.02170	-.05460	.03590	.00370	-2.33830	.00000	.55930	.00000	.00000
4.000	177.300	.15550	-.35640	-.02650	.05420	.00230	-2.15260	.00000	.75340	.00000	.00000
	GRADIENT	-.04812	-.01208	.00235	-.00394	-.00014	.02311	.00000	.02433	.00000	.00000

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                         MSFC 590(SA26F) 142-IN. SRB(133) NBRE1A                  (R95006)   ( 11 DEC 73  )

              REFERENCE DATA                                                                PARAMETRIC DATA

SREF  =      .5030 SQ. IN   XMRP  =     5.5570 IN.                        BETA   =      .000   PHI    =      .000
LREF  =      .8000 IN.      YMRP  =      .0000 IN.                        FWDSTK =      .000   AFTSTK =      .000
BREF  =      .8000 IN.      ZMRP  =      .0000 IN.                        ATHRNG =     1.000   ATMS   =      .000
SCALE =      .0036                                                        CONFIG =     1.000   SMDSTK =      .000
                                                                          ELT    =      .000   SEPRKT =      .000

                           RUN NO.   14/ 0    RN/L =   5.34    GRADIENT INTERVAL =  -5.00/  5.00

  MACH      ALPHA       CNM        CLMM       CYM        CYNM        CBL        CA         CAB        XCP/L      CPB1       CPB2
  4.450    180.310     .06010    -.19330    -.02660     .06570     .00690   -2.03800     .00000     .83590     .00000     .00000
  4.450    179.810     .09050    -.23110    -.02730     .09190    -.00310   -2.03920     .00000     .77480     .00000     .00000
  4.450    179.310     .09020    -.21430    -.03300     .06540     .00730   -2.04410     .00000     .76030     .00000     .00000
  4.450    178.810     .10590    -.26550    -.03360     .09190     .00520   -2.04680     .00000     .77100     .00000     .00000
  4.450    178.310     .12080    -.24720    -.03960     .07410     .03050   -2.04920     .00000     .73370     .00000     .00000
  4.450    177.810     .10590    -.28410    -.03930     .06570     .00790   -2.05640     .00000     .78520     .00000     .00000
  4.450    177.300     .16680    -.35050    -.04640     .09180    -.00150   -2.06900     .00000     .73990     .00000     .00000
  4.450    176.300     .16740    -.35150    -.04650     .10070     .02900   -2.08950     .00000     .73780     .00000     .00000
  4.450    175.300     .19750    -.33510    -.03970     .05740     .00880   -2.11070     .00000     .73490     .00000     .00000
  4.450    174.270     .27300    -.31550    -.03370     .04010     .00990   -2.13930     .00000     .66090     .00000     .00000
  4.450    172.270     .36240    -.13970    -.02790     .01280     .00400   -2.19930     .00000     .59900     .00000     .00000
  4.450    170.360     .52590     .04290    -.04160     .00170     .01350   -2.24680     .00000     .55990     .00000     .00000
  4.450    177.300     .15200    -.31720    -.02720     .07540     .02980   -2.06870     .00000     .73670     .00000     .00000
          GRADIENT   -.04281    -.01746     .00063     .00819    -.00033     .02174     .00000     .02472     .00000     .00000

                           RUN NO.   16/ 0    RN/L =   4.88    GRADIENT INTERVAL =  -5.00/  5.00

  MACH      ALPHA       CNM        CLMM       CYM        CYNM        CBL        CA         CAB        XCP/L      CPB1       CPB2
  4.959    180.320     .10490    -.14730    -.02570     .00450     .01210   -2.07590     .00000     .69100     .00000     .00000
  4.959    179.820     .08500    -.15100    -.02440    -.05310     .01710   -2.09730     .00000     .71140     .00000     .00000
  4.959    179.320     .08590    -.15330    -.00790    -.05210     .00560   -2.11060     .00000     .71210     .00000     .00000
  4.959    178.810     .10580    -.17500    -.01630    -.05240     .00620   -2.11010     .00000     .70140     .00000     .00000
  4.959    178.310     .12660    -.22040    -.00850    -.02860    -.00680   -2.11380     .00000     .70850     .00000     .00000
  4.959    177.810     .12670    -.19740    -.00020    -.02830     .00300   -2.11530     .00000     .69360     .00000     .00000
  4.959    177.310     .14670    -.24080    -.03510     .05100    -.01160   -2.13130     .00000     .70040     .00000     .00000
  4.959    176.310     .16710    -.21790    -.02670     .03980     .00960   -2.14920     .00000     .67290     .00000     .00000
  4.959    175.310     .18730    -.21900    -.03470     .01630     .01220   -2.17670     .00000     .65190     .00000     .00000
  4.959    174.270     .22740    -.21670    -.02670     .01660     .01160   -2.17760     .00000     .64430     .00000     .00000
  4.959    172.300     .32600    -.05170    -.02680    -.03100     .01560   -2.22280     .00000     .57950     .00000     .00000
  4.959    170.370     .50510     .02880    -.04610     .03630     .00560   -2.26390     .00000     .56190     .00000     .00000
  4.959    177.310     .12670    -.19720    -.01750     .00540     .00140   -2.13190     .00000     .69350     .00000     .00000
          GRADIENT   -.03759    -.01486     .00259    -.00574    -.00012     .01809     .00000     .01525     .00000     .00000
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DATE 06 NOV 74                    TABULATED SOURCE DATA,  MSFC TWT 590/595                                        PAGE    8

                                  MSFC 590(SA26F) 142-IN. SRB(139) NBRE1A                          (R05007)    ( 11 DEC 73  )

                REFERENCE DATA                                                                   PARAMETRIC DATA

                                                                                     BETA   =      .000   PHI    =      .000
SREF  =     .3030 SQ. IN   XMRP  =    5.5570 IN.                                     FWDSTK =      .000   AFTSTK =      .000
LREF  =     .8000 IN.      YMRP  =     .0000 IN.                                     ATHRNG =     1.000   ATHS   =      .000
BREF  =     .8000 IN.      ZMRP  =     .0000 IN.                                     CONFIG =     1.000   SHDSTK =      .000
SCALE =     .0236                                                                    ELT    =      .000   SEPRKT =      .000

                         RUN NO.   10/ 0    RN/L =   6.30    GRADIENT INTERVAL =  -5.00/  5.00

  MACH      ALPHA      CNM        CLMM       CYM        CYNM       CBL        CA         CAB        XCP/L      CPB1       CPB2
  3.480    180.310    .04590    -.10130    -.02740    .05570     .00810   -2.13940    .00000     .74870     .00000     .00000
  3.480    180.820    .01900    -.07180    -.02770    .07610    -.00750   -2.13590    .00000     .87460     .00000     .00000
  3.480    181.320   -.00790    -.03270    -.02700    .05020     .02250   -2.14100    .00000     .22960     .00000     .00000
  3.480    181.850   -.01690    -.02350    -.03070    .04990     .00890   -2.14230    .00000     .45230     .00000     .00000
  3.480    182.350   -.02540    -.00450    -.02330    .05530     .00335   -2.16500    .00000     .55190     .00000     .00000
  3.480    182.830   -.03240     .02400    -.02660    .03950     .00500   -2.17550    .00000     .60390     .00000     .00000
  3.480    183.360   -.06120     .04340    -.02650    .03940     .00970   -2.18840    .00000     .62440     .00000     .00000
  3.480    184.340   -.10560     .07100    -.03410    .05950     .00390   -2.20970    .00000     .62140     .00000     .00000
  3.480    185.350   -.15000     .10750    -.02970    .03890     .00090   -2.23210    .00000     .62500     .00000     .00000
  3.480    186.360   -.21150     .08050    -.03280    .03390     .00640   -2.26210    .00000     .59750     .00000     .00000
  3.480    188.370   -.36080    -.12190    -.04230    .01990    -.03310   -2.32520    .00000     .53950     .00000     .00000
  3.480    193.310   -.65070    -.28870    -.04830    .06270    -.00250   -2.37920    .00000     .53030     .00000     .00000
  3.480    183.350   -.04320     .03460    -.02710    .05000    -.02130   -2.18750    .00000     .63170     .00000     .00000
          GRADIENT   -.06173    -.01264    -.00207   -.00193    -.00092    -.02527    .00000    -.00599     .00000     .00000
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                          MSFC 590(SA26F) 142-IN. SRB(139) NBRE1A               (R95008)   ( 11 DEC 73  )

              REFERENCE DATA                                                           PARAMETRIC DATA

SREF  =        .3030 SQ. IN   XMRP  =      5.5570 IN.                        BETA   =       .000   PHI    =      .000
LREF  =        .8000 IN.      YMRP  =       .0000 IN.                        FWDSTK =       .000   AFTSTK =      .000
BREF  =        .8000 IN.      ZMRP  =       .0000 IN.                        ATHRNG =      1.000   ATHS   =      .000
SCALE =        .0056                                                         CONFIG =      1.000   SHDSTK =      .000
                                                                             ELT    =       .000   SEPRKT =      .000

                          RUN NO.    9/ 0    RN/L =   6.30    GRADIENT INTERVAL =  -5.00/  5.00

  MACH      ALPHA      CNM        CLMM       CYM        CYNM       CBL        CA          CAB        XCP/L      CFB1       CFB2
  3.480    170.320    .63860    -.25760    -.05250    -.01720    .00260   -2.35030    .00000     .59940     .00000     .00000
  3.480    172.240    .42620    -.46450    -.03280     .02180    .00280   -2.28270    .00000     .65540     .00000     .00000
  3.480    174.260    .27450    -.52250    -.02400     .01260    .00770   -2.22220    .00000     .72180     .00000     .00000
  3.480    175.270    .22930    -.50160    -.02820     .05350    .00430   -2.19830    .00000     .74490     .00000     .00000
  3.480    176.260    .18390    -.42030    -.02040     .04820    .00890   -2.18070    .00000     .75290     .00000     .00000
  3.480    177.290    .13810    -.34830    -.02410     .05780    .00340   -2.16130    .00000     .77220     .00000     .00000
  3.480    177.790    .12880    -.30640    -.02440     .07290    .00210   -2.15600    .00000     .76060     .00000     .00000
  3.480    178.300    .11060    -.28590    -.02030     .06270    .02120   -2.14110    .00000     .77730     .00000     .00000
  3.480    178.800    .09200    -.23430    -.02400     .06210    .02140   -2.13430    .00000     .77410     .00000     .00000
  3.480    179.300    .08290    -.21400    -.02030     .06730    .00210   -2.13160    .00000     .77700     .00000     .00000
  3.480    179.810    .05560    -.15320    -.02010     .06170    .00720   -2.13090    .00000     .79130     .00000     .00000
  3.480    180.310    .04630    -.11190    -.02040     .07680    .00120   -2.13300    .00000     .76340     .00000     .00000
  3.480    177.270    .14720    -.34810    -.02030     .05280    .00920   -2.16290    .00000     .75940     .00000     .00000
           GRADIENT  -.05458     .02621     .00250     .00837    .00057     .02173    .00000     .01709     .00000     .00000
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MSFC 590(SA26F) 142-IN. SRB(139) NBRE1 (R85009) (11 DEC 73)

REFERENCE DATA

SREF = .5030 SQ. IN XMRP = 5.5570 IN.
LREF = .8000 IN. YMRP = .0000 IN.
BREF = .8000 IN. ZMRP = .0000 IN.
SCALE = .0058

PARAMETRIC DATA

BETA = .000 PHI = .000
FWDSTK = .000 AFTSTK = .000
ATHRNG = 1.000 ATHS = .000
CONFIG = 2.000 SHDSTK = .000
ELT = .000 SEPRKT = .000

RUN NO. 5/ 1 P.N/L = 6.30 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALFHA	CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CPB1	CPB2
3.480	148.090	5.67260	-.02170	-.17150	-.00240	.01625	-2.36750	.00000	.56690	.00000	.00000
3.480	146.130	6.27470	.01670	-.18680	-.01490	.01290	-2.37940	.00000	.55630	.00000	.00000
3.480	141.930	7.61750	.07310	-.21190	.00180	.01590	-2.38780	.00000	.56570	.00000	.00000
3.480	137.730	8.92480	.11660	-.22890	-.00150	.01090	-2.39570	.00000	.56550	.00000	.00000
3.480	133.590	10.12740	.82120	-.25000	.01695	.01270	-2.37360	.00000	.55990	.00000	.00000
3.480	129.420	11.39460	1.17220	-.25100	-.05010	.03360	-2.57850	.00000	.55810	.00000	.00000
3.480	127.440	11.99760	1.28090	-.26210	-.03940	.01290	-1.96590	.00000	.55790	.00000	.00000
3.480	129.420	11.38610	1.14020	-.24700	-.06010	.03420	-2.07620	.00000	.55940	.00000	.00000
3.480	133.590	10.13640	.80070	-.24970	.00140	.01410	-2.37170	.00000	.56010	.00000	.00000
3.480	137.720	8.93430	.06500	-.22500	-.00520	.01570	-2.39320	.00000	.56590	.00000	.00000
3.480	141.910	7.61800	.05180	-.20420	-.01290	.04000	-2.38560	.00000	.56500	.00000	.00000
3.490	146.120	6.31060	-.00160	-.18710	-.01470	.03610	-2.37910	.00000	.56560	.00000	.00000
3.480	148.090	3.69720	-.05100	-.17920	.00260	.03030	-2.37190	.00000	.56730	.00000	.00000
	GRADIENT	-.30539	-.06620	.00415	.00251	.00013	-.01319	.00000	.00049	.00000	.00000

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                              MSFC 590(SA26F) 142-IN. SRB(130) NBRE1                    (R95D10)   ( 11 DEC 73  )

           REFERENCE DATA                                                                      PARAMETRIC DATA

 SREF  =      .5030 SQ. IN   XMRP  =     5.5570 IN.                          BETA   =      .000   PHI     =      .000
 LREF  =      .8000 IN.      YMRP  =      .0000 IN.                          FWDSTK =      .000   AFTSTK  =      .000
 BREF  =      .8000 IN.      ZMRP  =      .0000 IN.                          ATHRNG =     1.000   ATHS    =      .000
 SCALE =      .0056                                                          CONFIG =     2.000   SHDSTK  =      .000
                                                                             ELT    =      .000   SEPRKT  =      .000

                     RUN NO.   21/ 0    RN/L =   6.27    GRADIENT INTERVAL =  -5.00/  5.00

   MACH     ALPHA      CNM       CLMM       CYM       CYNM       CBL       CA        CAB       XCP/L      CPB1      CPB2
  3.480    169.770    .71230   -.40130   -.06490    .02970    .00910  -2.40700    .00000    .61250    .00000    .00000
  3.480    167.850   1.02300   -.32090   -.07440    .01260    .01080  -2.43980    .00000    .59210    .00000    .00000
  3.480    163.750   1.78680   -.14040   -.09820   -.01690    .01400  -2.50590    .00000    .57290    .00000    .00000
  3.480    159.610   2.69290    .10860   -.10570    .01580    .01540  -2.62160    .00000    .56320    .00000    .00000
  3.480    155.470   3.73470    .33150   -.12070   -.00330    .01710  -2.77760    .00000    .55930    .00000    .00000
  3.480    151.310   4.89010    .43500   -.14810    .01340    .01610  -2.83320    .00000    .55930    .00000    .00000
  3.480    149.280   5.56730   -.08110   -.15290    .04070    .01160  -2.37390    .00000    .56770    .00000    .00000
  3.480    151.270   4.96920   -.12980   -.14820    .02670    .02720  -2.36580    .00000    .56970    .00000    .00000
  3.480    155.410   3.80500   -.27730   -.14010    .05590    .01200  -2.36130    .00000    .57230    .00000    .00000
  3.480    159.610   2.69440    .08770   -.10600    .03140    .00950  -2.62990    .00000    .56390    .00000    .00000
  3.480    163.730   1.76040   -.14230   -.09830   -.00130    .01740  -2.51470    .00000    .57310    .00000    .00000
  3.480    157.850   1.00500   -.32300   -.08120   -.01350    .00890  -2.44930    .00000    .59270    .00000    .00000
  3.480    169.770    .71220   -.40230   -.06470    .01940    .00540  -2.41790    .00000    .61260    .00000    .00000
           GRADIENT  -.23369   -.02403    .00428   -.00111   -.00045    .00566    .00000    .00207    .00000    .00000
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                         MSFC 590(SA26F) 142-IN. SRB(139) NBRE1                       (R95011)   ( 11 DEC 73  )

          REFERENCE DATA                                                              PARAMETRIC DATA

SREF  =      .5030 SQ. IN   XMRP  =     5.5570 IN.                       BETA   =      .000   PHI    =      .000
LREF  =      .8000 IN.      YMRP  =      .0000 IN.                       FWDSTK =      .000   AFTSTK =      .000
BREF  =      .8000 IN.      ZMRP  =      .0000 IN.                       ATHRNG =     1.000   ATHS   =      .000
SCALE =      .0036                                                       CONFIG =     2.000   SHDSTK =      .000
                                                                         ELT    =      .000   SEPRKT =      .000

                         RUN NO.    8/ 0    RN/L =   8.25    GRADIENT INTERVAL =  -5.00/  5.00

  MACH      ALPHA       CNM        CLMM        CYM        CYNM        CBL         CA         CAB        XCP/L       CPB1       CPB2
 3.480    190.330    -.69040     .00910    -.08820     .00140     .00040   -2.41530     .00000     .55760     .00000     .00000
 3.480    188.410    -.42370     .11070    -.06070     .01210     .01100   -2.38710     .00000     .58795     .00000     .00000
 3.480    184.380    -.11230     .05160    -.03320     .01860     .00790   -2.30930     .00000     .60400     .00000     .00000
 3.480    180.310     .03540    -.09180    -.02420     .07650     .00150   -2.15425     .00000     .70190     .00000     .00000
 3.480    176.260     .17620    -.34510    -.02410     .04240    -.00390   -2.28545     .00000     .72635     .00000     .00000
 3.480    172.240     .42840    -.50250    -.03630     .01180     .00440   -2.37420     .00000     .66225     .00000     .00000
 3.480    170.310     .68320    -.42590    -.04560     .00520     .00340   -2.41340     .00000     .61720     .00000     .00000
 3.480    172.240     .41800    -.50150    -.07650    -.02130     .01460   -2.37395     .00000     .66445     .00000     .00000
 3.480    176.260     .18520    -.34490    -.02030     .03750     .00030   -2.28595     .00000     .71540     .00000     .00000
 3.480    180.320     .01980    -.07380    -.01990     .05120     .02120   -2.15570     .00000     .97562     .00000     .00000
 3.480    18[illegible].340    -.09410     .03130    -.02600     .02435    -.00225   -2.31455     .00000     .59370     .00000     .00000
 3.480    188.410    -.42320     .07890    -.05690     .01250     .01385   -2.39100     .00000     .59170     .00000     .00000
 3.480    190.390    -.69860    -.02390    -.08380    -.02895     .00735   -2.41955     .00000     .56370     .00000     .00000
         GRADIENT    -.03871     .02975    -.00146    -.00064     .00004    -.03227     .00000    -.00597     .00000     .00000

                         MSFC 590(SA26F) 142-IN. SRB(139) NBRE4S1 ELT                 (R95012)   ( 11 DEC 73  )

          REFERENCE DATA                                                              PARAMETRIC DATA

SREF  =      .5030 SQ. IN   XMRP  =     5.5570 IN.                       BETA   =      .000   PHI    =    45.000
LREF  =      .8000 IN.      YMRP  =      .0000 IN.                       FWDSTK =      .000   AFTSTK =      .000
BREF  =      .8000 IN.      ZMRP  =      .0000 IN.                       ATHRNG =     1.000   ATHS   =      .000
SCALE =      .0036                                                       CONFIG =     3.000   SHDSTK =      .000
                                                                         ELT    =     1.000   SEPRKT =     1.000

                         RUN NO.   28/ 0    RN/L =   4.77    GRADIENT INTERVAL =  -5.00/  5.00

  MACH      ALPHA       CNM        CLMM        CYM        CYNM        CBL         CA         CAB        XCP/L       CPB1       CPB2
   .598    10.210    1.09110    1.25700    -.49270    -.37330    -.08640     .88910     .44500     .47260    -.22140    -.27000
   .598    12.130    1.31820    1.50930    -.69130    -.60340    -.11040     .89850     .44130     .47310    -.29500    -.29390
   .598    16.200    1.94680    2.11210    -.98750   -1.33170    -.15980     .88990     .46060     .47950    -.29910    -.30450
   .595    20.250    2.56700    2.47360   -1.16120   -2.22520    -.17540     .89370     .56980     .4[illegible]    -.29220    -.34500
   .598    24.330    3.34190    3.07250   -1.48640   -3.52590    -.20120     .89670     .65290     .49150    -.32130    -.40140
   .598    29.420    4.18220    4.33220   -1.65600   -4.79460    [illegible]     .85400     .75900     .49200    -.39820    -.45740
   .598    30.370    4.55620    5.10120   -1.59620   -5.06540    -.20000     .93470     .81420     .47580    -.45[illegible]    -.49210
   .598    20.250    2.54890    2.49010   -1.14750   -2.[illegible]    [illegible]     .93270     .57530     .48690    -.29750    -.34[illegible]
         GRADIENT     .17412    [illegible]    -.05693    [illegible]    [illegible]    -.00217     .01923     .00343    -.01015    [illegible]
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MSFC 590(SA26F) 142-IN. SRB(139) NBRE1S1 ELT (R95012) (11 DEC 73)

REFERENCE DATA

SREF = .5030 SQ. IN XMRP = 5.5570 IN.
LREF = .8000 IN. YMRP = .0000 IN.
BREF = .8000 IN. ZMRP = .0000 IN.
SCALE = .0056

PARAMETRIC DATA

BETA = .000 PHI = 45.000
FWDSTK = .000 AFTSTK = .000
ATHRNG = 1.000 ATHS = .000
CONFIG = 3.000 SHDSTK = .000
ELT = 1.000 SEPRKT = 1.000

RUN NO. 29/ 0 RN/L = 6.07 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CPB1	CPB2
.900	10.250	1.10090	.39580	-.12320	.30880	-.04050	1.09840	.44900	.53720	-.23780	-.25320
.900	12.190	1.34770	.66400	-.31320	.14500	-.06150	1.11630	.46940	.52630	-.24490	-.27120
.900	18.310	2.71400	1.38850	-.64650	-.48760	-.10460	1.09850	.48730	.51030	-.25420	-.29160
.900	20.460	2.81880	2.29120	-.93440	-1.66480	-.16490	1.06850	.55230	.50020	-.29740	-.32000
.900	24.650	3.76230	3.72620	-1.24780	-3.14430	-.20430	1.03360	.61180	.49620	-.31810	-.35490
.900	28.900	4.81460	6.02200	-1.21610	-3.89340	-.20740	.99070	.70530	.46450	-.36990	-.40540
.900	30.880	5.20860	6.69900	-.83290	-2.89500	-.21650	.93200	.77000	.46160	-.40520	-.44990
.900	20.460	2.80720	2.30110	-.93370	-1.55000	-.15450	1.06370	.53950	.49970	-.29160	-.31150
	GRADIENT	.20340	.30918	-.04471	-.20101	-.00890	-.00786	.01501	-.00361	-.00784	-.00955

RUN NO. 30/ 0 RN/L = 6.51 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CPB1	CPB2
1.202	10.380	1.22610	1.56550	-.51450	-.10120	-.06890	1.56560	.47920	.46240	-.25790	-.26760
1.202	12.390	1.49800	2.17580	-.71820	-.16230	-.08120	1.57360	.48190	.44810	-.25760	-.27310
1.202	16.550	2.20770	3.53660	-1.12770	-.57310	-.11940	1.56800	.51230	.43590	-.26940	-.29350
1.202	20.820	3.21500	5.37840	-1.23730	-2.17330	-.15220	1.52300	.56970	.43010	-.29640	-.32900
1.202	25.160	4.56480	7.57870	-.71710	-3.58010	-.12140	1.45840	.64920	.43110	-.34570	-.38580
1.202	29.520	6.47780	8.66840	.02590	-3.00010	-.10960	1.41510	.79320	.45740	-.42540	-.44450
1.202	31.600	7.40840	9.22970	.20830	-1.89630	-.12270	1.40150	.84330	.46490	-.45300	-.47170
1.202	20.830	3.21910	5.46070	-1.21300	-2.08500	-.16100	1.51100	.57190	.42920	-.33010	-.32930
	GRADIENT	.29002	.37724	.03922	-.13679	-.00198	-.00875	.01745	.00023	-.00941	-.00972

RUN NO. 31/ 0 RN/L = 7.21 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CPB1	CPB2
1.962	10.490	1.19530	2.73390	-.26450	.05030	-.05460	1.10090	.29970	.39000	-.15470	-.17510
1.962	12.310	1.59880	3.48950	-.38580	-.00240	-.05410	1.08670	.28550	.39950	-.14700	-.16720
1.962	16.790	2.72320	4.75040	-.45810	-.35380	-.09390	1.10690	.31890	.42420	-.16590	-.18490
1.962	21.090	4.02650	5.67060	.00140	-1.39200	-.05700	1.12270	.36930	.45170	-.19550	-.21000
1.962	25.390	5.67990	5.85770	.25920	-.71980	-.06010	1.14130	.41310	.48240	-.22000	-.23340
1.962	29.670	7.47480	5.52380	.24740	.04720	-.14090	1.13070	.39280	.50630	-.23450	-.22740
1.962	31.760	8.29190	6.02960	.19390	.16030	-.13580	1.13920	.38690	.50720	-.23310	-.22190
1.962	21.070	4.06020	5.56880	.03400	-1.39240	-.06400	1.06520	.32590	.45470	-.17590	-.19130
	GRADIENT	.33776	.13936	.03263	.00021	-.00357	.00228	.00549	.00637	-.00302	-.00259

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DATE 08 NOV 74                    TABULATED SOURCE DATA,  MSFC TWT 590/595

                              MSFC 590(SA26F) 142-IN. SRB(139) NBRE1S1 ELT                    (R95012)   ( 11 DEC 73  )

                                                                                              PARAMETRIC DATA
            REFERENCE DATA
                                                                                  BETA   =     .000   PHI    =    45.000
 WREF  =      .5030 SQ. IN   XMRP  =     5.5570 IN.                               FWDSTK =     .000   AFTSTK =      .000
 LREF  =      .8000 IN.      YMRP  =      .0000 IN.                               ATHRNG =    1.000   ATHS   =      .000
 BREF  =      .8000 IN.      ZMRP  =      .0000 IN.                               CONFIG =    3.000   SHDSTK =      .000
 SCALE =      .0056                                                               ELT    =    1.000   SEPRKT =     1.000

                        RUN NO.   27/ 0    RN/L =   6.60    GRADIENT INTERVAL =  -5.00/  5.00

   MACH      ALPHA       CNM        CLMM       CYM        CYNM       CBL        CA         CAB       XCP/L      CPB1       CPB2
   3.479     10.360     1.34390    2.28070   -.05550    -.04100    -.03350     .78890     .17040    .42910    -.09940    -.09950
   3.479     12.290     1.74400    2.53310   -.03250    -.14740    -.04490     .78390     .16490    .44810    -.09460    -.09590
   3.479     16.420     2.72570    2.89150    .10970    -.40010    -.04980     .80030     .15400    .49000    -.09250    -.09530
   3.479     20.590     3.85610    3.18650    .10310    -.04630    -.05990     .86700     .14900    .49930    -.07920    -.08440
   3.479     24.760     5.07690    3.54020    .09170     .02510    -.08690     .94540     .13550    .50970    -.07210    -.07650
   3.479     28.920     6.29660    4.18110    .06080     .05640    -.11150    1.01410     .11890    .51240    -.06300    -.05750
   3.479     30.920     6.91440    4.53910    .06170     .05570    -.10640    1.05030     .11150    .51300    -.05940    -.05410
   3.479     20.590     3.83020    3.16460    .09890    -.03910    -.05940     .84440     .12900    .49910    -.06710    -.07350
            GRADIENT     .27299     .10309    .00494     .01163    -.00373     .01344    -.00277    .00399     .00135     .00167

                              MSFC 590(SA26F) 142-IN. SRB(139) NBRE1S1 ELT                    (R95015)   ( 11 DEC 73  )

                                                                                              PARAMETRIC DATA
            REFERENCE DATA
                                                                                  BETA   =     .000   PHI    =    90.000
 BREF  =      .5030 SQ. IN   XMRP  =     5.5570 IN.                               FWDSTK =     .000   AFTSTK =      .000
 LREF  =      .8000 IN.      YMRP  =      .0000 IN.                               ATHRNG =    1.000   ATHS   =      .000
 BREF  =      .8000 IN.      ZMRP  =      .0000 IN.                               CONFIG =    3.000   SHDSTK =      .000
 SCALE =      .0056                                                               ELT    =    1.000   SEPRKT =     1.000

                        RUN NO.   33/ 0    RN/L =   4.74    GRADIENT INTERVAL =  -5.00/  5.00

   MACH      ALPHA       CNM        CLMM       CYM        CYNM       CBL        CA         CAB       XCP/L      CPB1       CPB2
    .397     10.230     1.33450    1.16260   -.34360     .13890    -.16270     .89530     .46690    .49550    -.24330    -.27010
    .397     12.150     1.64090    1.32190   -.51940     .32380    -.16220     .91780     .44520    .50050    -.21800    -.27430
    .397     16.240     2.49240    2.21840  -1.30850    1.11310    -.21940     .96610     .51050    .49390    -.24720    -.31790
    .397     20.350     3.49200    3.41150  -2.35050    1.19990    -.27270     .91670     .53890    .49690    -.24720    -.35190
    .397     24.490     4.69690    5.04700  -3.17070    -.21220    -.35340     .96920     .60970    .47990    -.29040    -.39720
    .397     28.620     5.94860    6.68520  -3.70960   -2.00180    -.42590     .94230     .70310    .47490    -.32520    -.45590
    .397     30.590     6.62090    7.52480  -4.02690   -2.63240    -.45230     .80760     .75620    .47390    -.34590    -.49500
    .397     20.350     3.48840    3.46830  -2.37710    1.22730    -.24140     .92230     .54990    .49540    -.25310    -.35510
            GRADIENT     .26113     .32016   -.18954    -.14064    -.01516    -.00509     .01455   -.00132    -.00349    -.01091
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DATE 08 NOV 74                TABULATED SOURCE DATA,  MSFC TWT 590/595                                    PAGE  36

                                   MSFC 590(SA26F) 142-IN. SRB(139) NBRE1S1 ELT                  (R95013)   ( 11 DEC 73  )

              REFERENCE DATA                                                                           PARAMETRIC DATA

SREF  =       .5030 SQ. IN   XMRP  =     5.5570 IN.                                   BETA   =      .000  PHI    =    90.000
LREF  =       .8000 IN.      YMRP  =      .0000 IN.                                   FWDSTK =      .000  AFTSTK =      .000
BREF  =       .8000 IN.      ZMRP  =      .0000 IN.                                   ATHRNG =     1.000  ATHS   =      .000
SCALE =       .0056                                                                   CONFIG =     3.000  SMDSTK =      .000
                                                                                      ELT    =     1.000  SEPRKT =     1.000

                          RUN NO.   32/ 0    RN/L =   5.96    GRADIENT INTERVAL =  -5.00/  5.00

  MACH      ALPHA      CNM        CLMM       CYM        CYNM       CBL        CA         CAB        XCP/L      CPB1       CPB2
   .903     10.290    1.38850     .39030    -.08310     .10250    -.13550    1.08090     .42720     .54360    -.21780    -.25290
   .903     12.280    1.80770     .83990    -.37260     .19010    -.16600    1.10790     .44430     .52960    -.22870    -.26290
   .903     16.450    2.75920    2.19230   -1.28040     .51480    -.23460    1.11520     .46990     .50170    -.23420    -.29450
   .903     20.680    4.01380    3.78770   -2.43720    -.60710    -.32330    1.07760     .52760     .48960    -.26260    -.32000
   .903     24.980    5.47460    6.10420   -3.40510   -3.15300    -.36200    1.07840     .66940     .47560    -.34250    -.39370
   .903     29.340    7.17940    8.86970   -3.87230   -4.17840    -.40810    1.06350     .75810     .46590    -.39990    -.44490
   .903     31.420    8.08910   10.35660   -4.09550   -4.50160    -.44840    1.03140     .79940     .46180    -.40950    -.47290
   .903     20.680    3.98830    3.76890   -2.43650    -.50030    -.32640    1.08020     .54750     .48950    -.27640    -.32740
          GRADIENT     .31613     .47074    -.20039    -.25136    -.01457    -.00265     .01843    -.00372    -.00950    -.01059

                          RUN NO.   31/ 0    RN/L =   6.29    GRADIENT INTERVAL =  -5.00/  5.00

  MACH      ALPHA      CNM        CLMM       CYM        CYNM       CBL        CA         CAB        XCP/L      CPB1       CPB2
  1.200     10.410    1.55570    1.48160    -.54130     .26960    -.17650    1.59620     .47400     .49990    -.24110    -.28130
  1.200     12.420    1.98130    1.99770    -.89850     .52300    -.21650    1.59120     .50060     .49430    -.26160    -.28970
  1.200     16.660    3.06620    3.40990   -1.91100    1.26150    -.29240    1.59670     .57530     .47590    -.30750    -.32350
  1.200     21.020    4.52370    5.32350   -2.45020     .38640    -.38390    1.56930     .65450     .47050    -.35390    -.35350
  1.200     25.460    6.33370    7.94800   -2.61010    -.80420    -.45890    1.56490     .76210     .45420    -.41420    -.42050
  1.200     29.930    8.22420   10.60170   -2.56610   -1.32720    -.51030    1.55410     .84940     .46140    -.45180    -.45950
  1.200     32.010    9.21580   11.43290   -2.49520   -1.36270    -.53930    1.50410     .85730     .45530    -.45940    -.49100
  1.200     21.530    4.54450    5.43190   -2.41540     .36870    -.37610    1.55620     .64530     .46900    -.35080    -.35740
          GRADIENT     .35720     .47725    -.09049    -.10146    -.01707    -.00319     .01895    -.00119    -.01077    -.00979

                          RUN NO.   30/ 0    RN/L =   7.21    GRADIENT INTERVAL =  -5.00/  5.00

  MACH      ALPHA      CNM        CLMM       CYM        CYNM       CBL        CA         CAB        XCP/L      CPB1       CPB2
  1.961     10.520    1.53780    2.38360    -.38210     .70370    -.12060    1.10180     .25410     .44010    -.12790    -.15340
  1.961     12.550    2.33170    3.15040    -.59640     .99070    -.14210    1.10910     .25550     .44000    -.13170    -.14950
  1.961     16.850    3.32840    4.44200    -.78690    1.15660    -.20220    1.13640     .31120     .45770    -.16030    -.18230
  1.961     21.210    4.82730    5.59730    -.79110    1.11940    -.26500    1.18600     .35500     .47200    -.17950    -.21190
  1.961     25.570    6.42410    6.61830    -.73540     .70840    -.32620    1.24640     .38690     .49250    -.19910    -.22590
  1.961     29.880    8.09460    6.97840    -.56790     .57570    -.39240    1.26890     .40550     .49520    -.21900    -.22540
  1.961     31.940    8.94610    7.15010    -.57900     .80810    -.42350    1.27130     .40130     .50130    -.22070    -.21940
  1.961     21.200    4.84140    5.54070    -.77560    1.09910    -.27010    1.15560     .33180     .47320    -.16780    -.19800
          GRADIENT     .34823     .22439    -.00390    -.01064    -.01425     .00983     .00769     .00350    -.00452    -.00371
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                                MSFC 590(SA26F) 142-IN. SRB(139) NBRE1S1 ELT                    (R95013)   ( 11 DEC 73  )

                 REFERENCE DATA                                                                   PARAMETRIC DATA

SREF  =     .5030 SQ. IN   XMRP  =     5.5570 IN.                                   BETA   =      .000   PHI    =    90.000
LREF  =     .8000 IN.      YMRP  =      .0000 IN.                                   FWDSTK =      .000   AFTSTK =      .000
BREF  =     .8000 IN.      ZMRP  =      .0000 IN.                                   ATHRNG =     1.000   ATMS   =      .000
SCALE =     .0036                                                                   CONFIG =     3.000   SHDSTK =      .000
                                                                                    ELT    =     1.000   SEPRAT =     1.000

                          RUN NO.   26/ 0    RN/L =   6.90    GRADIENT INTERVAL =  -5.00/  5.00

 MACH     ALPHA     CNM       CLMM       CYM       CYNM      CBL       CA        CAB      XCP/L     CPB1      CPB2
 3.479    10.380   1.54160   2.39710   -.01830    .29680   -.08310    .81760    .16270    .43570   -.08210   -.08550
 3.479    12.350   2.02440   2.72710   -.04070    .29350   -.10940    .92970    .15630    .45570   -.07940   -.09330
 3.479    16.320   3.08430   3.23640   -.05420    .13260   -.14790    .86310    .14250    .48090   -.07270   -.08350
 3.479    20.650   4.26930   3.58590   -.15040    .19650   -.21170    .92530    .12230    .49320   -.08930   -.07770
 3.479    24.920   5.60790   3.86150   -.25340    .21930   -.26510   1.02470    .13510    .51040   -.07350   -.07420
 3.479    29.000   6.94720   4.41890   -.36890    .18020   -.33190   1.09930    .11980    .51450   -.08550   -.05300
 3.479    30.990   7.38650   4.69600   -.41200    .15970   -.34610   1.14040    .11520    .51600   -.05400   -.05190
 3.479    20.650   4.27980   3.39170   -.13050    .19130   -.20730    .91820    .11390    .49910   -.05270   -.07390
         GRADIENT   .29513    .10473   -.01976   -.03319   -.01300    .01625   -.00215    .00061    .00073    .00153

                                MSFC 590(SA26F) 142-IN. SRB(139) NBRE1S1 ELT                    (R95014)   ( 11 DEC 73  )

                 REFERENCE DATA                                                                   PARAMETRIC DATA

SREF  =     .5030 SQ. IN   XMRP  =     5.5570 IN.                                   BETA   =      .000   PHI    =   135.000
LREF  =     .8000 IN.      YMRP  =      .0000 IN.                                   FWDSTK =      .000   AFTSTK =      .000
BREF  =     .8000 IN.      ZMRP  =      .0000 IN.                                   ATHRNG =     1.000   ATMS   =      .000
SCALE =     .0036                                                                   CONFIG =     3.000   SHDSTK =      .000
                                                                                    ELT    =     1.000   SEPRAT =     1.000

                          RUN NO.   34/ 0    RN/L =   4.89    GRADIENT INTERVAL =  -5.00/  5.00

 MACH     ALPHA     CNM       CLMM       CYM       CYNM      CBL       CA        CAB      XCP/L     CPB1      CPB2
  .594    10.200    .97070   1.07210    .22530   -.21020   -.13150    .86590    .43630    .47650   -.21990   -.25130
  .594    12.120   1.16120   1.22910    .32920   -.38080   -.18110    .87590    .46520    .48170   -.23340   -.27390
  .594    16.170   1.73990   1.85200    .61940   -.67000   -.24860    .87940    .51220    .47990   -.22520   -.30920
  .594    20.240   2.33150   2.56970   1.01970   -.49890   -.32130    .99120    .60110    .47570   -.30330   -.35300
  .594    24.320   3.10380   3.48870   1.14090    .82950   -.39530    .86480    .65040    .47490   -.33320   -.39970
  .594    28.400   3.94180   4.36740   1.08880   2.03940   -.46000    .93730    .74020    .47620   -.35530   -.45530
  .594    30.340   4.22920   4.88660    .96820   2.12160   -.48440    .78890    .74150    .47230   -.34970   -.47340
  .594    20.230   2.30920   2.53500   1.02220   -.49390   -.32910    .87860    .59230    .47700   -.29570   -.33900
         GRADIENT   .16512    .19171    .04280    .13500   -.01731   -.00315    .01615   -.00022   -.00724   -.01074
```

MSFC 590(SA26F) 142-IN. SRB(139) NBRE1S1 ELT (R95014) (11 DEC 73)

REFERENCE DATA

SREF = .5030 SQ. IN XMRP = 5.5570 IN.
LREF = .8000 IN. YMRP = .0000 IN.
BREF = .8000 IN. ZMRP = .0000 IN.
SCALE = .0056

PARAMETRIC DATA

BETA = .000 PHI = 135.000
FLOSTK = .000 AFTSTK = .000
ATHRNG = 1.000 ATMS = .000
CONFIG = 3.000 SHDSTK = .000
ELT = 1.000 SEPRAT = 1.000

RUN NO. 35/ 0 RN/L = 6.17 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CPB1	CPB2
.899	10.240	1.01730	.33660	.35810	-.42680	-.11890	1.08580	.44460	.53950	-.22970	-.25270
.899	12.190	1.31000	.71950	.39970	-.52740	-.15060	1.09780	.46150	.52170	-.24010	-.25740
.899	16.320	1.95000	1.71880	.23910	-.90170	-.24900	1.08420	.52250	.49450	-.28050	-.29250
.899	20.470	2.69610	2.90160	.25680	-1.30380	-.33760	1.04980	.57760	.47870	-.30970	-.32380
.899	24.660	3.63090	4.39740	-.06820	-2.12660	-.38120	1.00170	.64770	.45770	-.34220	-.35910
.899	28.910	4.73980	6.50860	-.20370	-2.45050	-.45100	.97890	.70960	.45450	-.38350	-.41080
.899	30.910	5.20120	7.49530	-.17210	-2.12550	-.48490	.93570	.74740	.44900	-.39210	-.42330
.899	20.470	2.69730	2.88200	.23870	-1.29820	-.32560	1.05900	.57630	.47940	-.31140	-.31990
	GRADIENT	.20346	.34440	-.03045	-.09979	-.01763	-.00745	.01475	-.00414	-.00790	-.00941

RUN NO. 36/ 0 RN/L = 6.54 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CPB1	CPB2
1.201	10.360	1.18840	1.35140	.16980	-.47660	-.15970	1.56540	.46090	.47350	-.23040	-.27830
1.201	12.330	1.45100	1.79910	.15240	-.44540	-.18970	1.56950	.47690	.46530	-.24370	-.29130
1.201	16.500	2.11200	2.99490	.02750	-.24900	-.26610	1.54690	.53100	.45090	-.28230	-.30030
1.201	20.760	3.07490	4.75220	.02050	-.32410	-.35690	1.51270	.57770	.44050	-.30150	-.32990
1.201	25.110	4.40740	7.03270	.56740	-.69130	-.42890	1.49350	.65180	.43540	-.34930	-.37750
1.201	29.490	6.07740	9.11060	.95200	.47870	-.49770	1.48050	.77330	.44430	-.40130	-.44970
1.201	31.570	7.06220	9.38970	1.15720	1.31540	-.53710	1.45150	.79200	.45590	-.40350	-.45320
1.201	20.770	3.11920	4.83290	.08540	-.40190	-.34990	1.50450	.55950	.44020	-.30140	-.32040
	GRADIENT	.27396	.40965	.04839	.06167	-.01795	-.00339	.01521	-.00105	-.00853	-.00915

RUN NO. 49/ 0 RN/L = 7.21 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CPB1	CPB2
1.962	10.480	1.25600	2.43250	.20590	-.18580	-.11650	1.17810	.31770	.40950	-.15490	-.13720
1.962	12.490	1.63650	3.08830	.25030	-.18555	-.14690	1.12320	.29590	.41260	-.14590	-.15900
1.962	16.770	2.74700	4.51410	.50790	-.38390	-.21680	1.05990	.25290	.43250	-.12640	-.15150
1.962	21.080	4.12030	5.48250	.74940	-.46745	-.26590	1.10730	.30710	.45920	-.15770	-.15040
1.962	25.410	5.65990	6.20530	1.02310	-.45820	-.33530	1.11740	.29540	.47710	-.14290	-.19420
1.962	29.700	7.20340	6.50620	1.10920	-.01240	-.40430	1.14240	.31240	.49290	-.15190	-.15180
1.962	31.760	8.08370	6.65560	1.17270	-.08700	-.43590	1.15830	.35220	.49340	-.19240	-.19320
1.962	21.070	4.14470	5.41500	.75880	-.47800	-.27300	1.04340	.25790	.45170	-.12950	-.15490
	GRADIENT	.32333	.19815	.04832	.00343	-.01495	.00040	.00193	.00449	-.00149	-.00253

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                              MSFC 593(SA26F) 142-IN. SRB(139) NBRE181 ELT                    (R05D14)    ( 11 OCT 73 )

           REFERENCE DATA                                                                           PARAMETRIC DATA

SREF  =     .5030 SQ. IN   XMRP  =     5.5570 IN.                              BETA    =      .000   PHI      =   [illegible]
LREF  =     .8000 IN.      YMRP  =      .0000 IN.                              [illegible] =  .000   [illegible] =      .000
BREF  =     .9000 IN.      ZMRP  =      .0000 IN.                              [illegible] = 1.000   [illegible] =      .000
SCALE =     .0056                                                              CONFIG  =     3.000   [illegible] =      .000
                                                                               ELT     =     1.000   [illegible] =     1.000

                         RUN NO.   88/ 0   RN/L =   [illegible]   GRADIENT INTERVAL =  -5.00/  5.00

   MACH      ALPHA       CNM        CLMM        CYM         CYNM        CBL         CA          CAB        XCP/L       CPB1        CPB2
   3.473    [illegible]  1.40380    2.36980     .29330    [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]
   3.479     12.330     1.83080    2.62190     .33362     -.22216     -.12920   [illegible] [illegible] [illegible] [illegible] [illegible]
   3.479     16.450     2.81540    2.95760     .44512   [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]
   3.479     20.500     3.[illegible] 3.27016  .48245   [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]
   3.479     24.750     5.14940    3.43390     .60450   [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]
   3.479     28.900     6.43447    3.94320     .73150   [illegible]   -.34[illegible] [illegible] [illegible] [illegible] [illegible] [illegible]
   3.479     30.890     7.10263    4.20310     .79170   [illegible]   -.37647   [illegible]   .13951    [illegible] [illegible] [illegible]
   3.479     25.390     5.39245    3.27370     .49215   [illegible]   -.21490   [illegible] [illegible]   .43797   [illegible] [illegible]
            GRADIENT     .27924     .08332     .02301   [illegible]   -.01412   [illegible] [illegible]   .00417   [illegible] [illegible]

                              MSFC 590(SA26F) 142-IN. SRB(139) NBRE181 ELT                    [illegible]   [illegible]

           REFERENCE DATA                                                                           PARAMETRIC DATA

SREF  =     .5030 SQ. IN   XMRP  =     5.5570 IN.                              [illegible] =   .000   PHI      =   [illegible]
LREF  =     .8000 IN.      YMRP  =      .0000 IN.                              [illegible] =   .000   [illegible] =      .000
BREF  =     .9000 IN.      ZMRP  =      .0000 IN.                              [illegible] =  1.000   [illegible] =      .000
SCALE =     .0056                                                              CONFIG  =      3.000   [illegible] =      .000
                                                                               ELT     =      1.000   [illegible] =     1.000

                         RUN NO.   73/ 0   RN/L =   4.95   GRADIENT INTERVAL =  -5.00/  5.00

   MACH      ALPHA       CNM        CLMM        CYM         CYNM        CBL         CA          CAB        XCP/L       CPB1        CPB2
    .598     49.000     6.94640    9.47940   -1.99840      .65200     -.24580      .41635   [illegible]  .45[illegible] [illegible] [illegible]
    .598     51.730     8.16950   11.21480   -3.02760      .70210     -.23340      .34655   [illegible]  .45450   [illegible] [illegible]
    .598     55.780    10.15310   13.80100   -3.03880     1.11600     -.22490      .20455   [illegible]  .45575   [illegible] [illegible]
    .598     59.300    11.53930   15.50330   -1.33020    -1.91765     -.17920     -.01670   [illegible]  .45595   [illegible] [illegible]
    .598     63.000    12.02593   15.60345    -.82700    -2.15730     -.13770     -.25190   [illegible]  .46[illegible] [illegible] [illegible]
    .598     67.780    12.23520   14.53420    -.46780      .12393     -.09125     -.26230   [illegible]  .45[illegible] [illegible] [illegible]
    .598     69.690    12.55300   15.21090    -.19990     1.26633     -.06555     -.29533   [illegible]  .45[illegible] [illegible] [illegible]
    .598     59.850    11.49450   15.52130   -1.39525    -1.58730     -.16793     -.01433   [illegible]  .45533   [illegible] [illegible]
            GRADIENT     .26764     .25393     .13178     -.03329      .00926     -.03964   [illegible]  .00074   [illegible] [illegible]
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                              MSFC 590(SA26F) 142-IN. SRB(139) NBRE121 ELT          (R95015)   ( 11 OCT 73 )

              REFERENCE DATA                                                        PARAMETRIC DATA

SREF  =     .5930 SQ. IN   XMRP  =    5.5570 IN.                      BETA   =     .000   PHI    =   45.000
LREF  =     .8000 IN.      YMRP  =     .0000 IN.                      FWDSTR =     .000   AFTSTR =     .000
BREF  =     .8000 IN.      ZMRP  =     .0000 IN.                      ATHENG =    1.000   ATHS   =     .000
SCALE =     .0056                                                     CONFIG =    3.000   SHOSTR =     .000
                                                                      ELT    =    1.000   SEPSKT =    1.000

                            RUN NO.   74/ 0    RNVL =   6.25    GRADIENT INTERVAL =  -5.00/  5.00

  MACH     ALPHA      CNM       CLMM       CYM       CYNM       CBL        CA        CAB       XCP/L      CPB1      CPB2
   .903    50.150   11.02890   17.05230   -.35340    -.97350   -.12050    .49830    .00000    .44040    .00000    .00000
   .903    52.080   11.90720   17.60290   -.14810   -2.32880   -.05770    .41940    .00000    .44160    .00000    .00000
   .903    56.110   13.00050   19.42960   -.33010   -1.46440   -.07620    .26450    .00000    .44450    .00000    .00000
   .903    60.160   14.35520   20.98450   -.17390   -1.26250   -.10730    .13570    .00000    .44730    .00000    .00000
   .903    64.120   14.60650   20.04810   -.13170    -.39680   -.10570    .08140    .00000    .45510    .00000    .00000
   .903    68.080   14.91450   18.53260   -.03260    -.62530   -.07100    .07230    .00000    .46510    .00000    .00000
   .903    69.930   14.95730   17.52260   -.00900    -.60660   -.06240    .15500    .00000    .47150    .00000    .00000
   .903    60.150   14.49280   20.65210   -.16620   -1.16430   -.42100    .14110    .00000    .44970    .00000    .00000
         GRADIENT     .20564     .04278    .01439     .06046    .00098   -.01947    .00000    .00150    .00000    .00000

                            RUN NO.   73/ 0    RNVL =   6.66    GRADIENT INTERVAL =  -5.00/  5.00

  MACH     ALPHA      CNM       CLMM       CYM       CYNM       CBL        CA        CAB       XCP/L      CPB1      CPB2
  1.200    50.120   13.91460   14.32070    .04380    -.73920   -.22800    .91230    .00000    .49280    .00000    .00000
  1.200    52.030   14.65310   14.60480   -.09150     .69920   -.22690    .95650    .00000    .49520    .00000    .00000
  1.200    55.070   15.76220   15.59880   -.04450    -.76160   -.19600    .92470    .00000    .49430    .00000    .00000
  1.200    60.060   16.75590   15.77910   -.08940    -.89670   -.19130    .59720    .00000    .49390    .00000    .00000
  1.200    64.030   17.55740   13.51930   -.10250    -.86730   -.18890    .78550    .00000    .49540    .00000    .00000
  1.200    67.990   18.73130   14.51760   -.11480    -.72670   -.19020    .69940    .00000    .50190    .00000    .00000
  1.200    69.950   19.57770   14.27920   -.09450    -.63530   -.17730    .64600    .00000    .50390    .00000    .00000
  1.200    60.050   16.69800   15.52160   -.08980    -.86540   -.18450    .70650    .00000    .49370    .00000    .00000
         GRADIENT     .23327    -.00924   -.00255     .00374    .00243   -.01147    .00000    .00139    .00000    .00000

                            RUN NO.   32/ 0    RNVL =   7.30    GRADIENT INTERVAL =  -5.00/  5.00

  MACH     ALPHA      CNM       CLMM       CYM       CYNM       CBL        CA        CAB       XCP/L      CPB1      CPB2
  1.981    49.930   13.51520    9.08400   -.10760     .01150   -.18630   1.18290    .00000    .51200    .00000    .00000
  1.981    51.870   14.14510    9.39410   -.09680    -.01810   -.19390   1.16550    .00000    .51240    .00000    .00000
  1.981    53.940   15.27340    9.52980   -.13730    -.01180   -.19750   1.13960    .00000    .51550    .00000    .00000
  1.981    59.860   16.31790   10.15880   -.16630    -.08190   -.19360   1.11340    .00000    .51590    .00000    .00000
  1.981    62.960   16.90500   10.19970   -.14600    -.05450   -.19290   1.05130    .00000    .51740    .00000    .00000
  1.981    67.070   17.71810   10.49060   -.15280    -.06730   -.17120    .97670    .00000    .51930    .00000    .00000
  1.981    69.770   19.03750   10.55070   -.16100    -.05330   -.15750    .93180    .00000    .51890    .00000    .00000
  1.981    53.030   13.92640    9.31600   -.14390     .07540   -.16380   1.10360    .00000    .51990    .00000    .00000
         GRADIENT     .22224     .07276   -.00305    -.00359    .01152   -.01242    .00000    .00034    .00000    .00000
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DATE 08 NOV 74                    TABULATED SOURCE DATA:  MSFC TWT 590/595                                PAGE  2

                                  MSFC 590(SA26F) 142-IN. SRB(139) NBRE1S1 ELT                 (R05016)   ( 11 DEC 73  )

                                                                                          PARAMETRIC DATA
              REFERENCE DATA

SREF  =        .5030 SQ. IN   XMRP  =     5.5570 IN.                          BETA    =      .000   PHI     =     93.000
LREF  =        .8000 IN.      YMRP  =      .0000 IN.                          FWDSTK  =      .000   AFTSTK  =       .000
BREF  =        .8000 IN.      ZMRP  =      .0000 IN.                          ATHRNG  =     1.000   ATMS    =       .000
SCALE =        .0036                                                          CONFIG  =     3.000   SHDSTK  =       .000
                                                                              ELT     =     1.000   SEPRKT  =      1.000

                          RUN NO.   90/ 0   RN/L =   4.96   GRADIENT INTERVAL =  -5.00/  5.00

 MACH      ALPHA      CNM        CLMM        CYM        CYNM       CBL        CA        CAB       XCP/L      CPB1      CPB2
  .599     49.890   10.85150   14.60270   -7.36320   -1.47650   -.51950    .48010    .00000    .45690    .00000    .00000
  .599     51.800   11.58080   15.31620   -7.39540    -.84480   -.53770    .41690    .00000    .45970    .00000    .00000
  .599     55.820   12.48110   16.57040   -7.88440   -1.70000   -.32740    .13250    .00000    .45910    .00000    .00000
  .599     59.840   13.38140   17.85590   -7.11570   -2.57370   -.49390   -.00350    .00000    .45780    .00000    .00000
  .599     63.840   14.40970   19.00990   -5.93300   -3.21050   -.51690   -.06450    .00000    .45990    .00000    .00000
  .599     67.850   14.81970   18.53760   -5.02470    -.08670   -.51390   -.14750    .00000    .46450    .00000    .00000
  .599     69.760   15.05470   18.77160   -4.99760     .59220   -.51670   -.12650    .00000    .46480    .00000    .00000
  .599     59.850   13.45850   17.87030   -7.14590   -2.52170   -.50900   -.03170    .00000    .45920    .00000    .00000
          GRADIENT    .21088     .21507     .14436     .05745     .00365   -.03167    .00000    .00036    .00000    .00000

                          RUN NO.   89/ 0   RN/L =   6.25   GRADIENT INTERVAL =  -5.00/  5.00

 MACH      ALPHA      CNM        CLMM        CYM        CYNM       CBL        CA        CAB       XCP/L      CPB1      CPB2
  .902     50.170   13.31030   18.34800   -4.50530    -.50780   -.57270    .57670    .00000    .45410    .00000    .00000
  .902     52.110   13.94150   19.55330   -4.28820    -.84450   -.57570    .55400    .00000    .45210    .00000    .00000
  .902     56.170   15.04120   21.45090   -3.85430    -.65720   -.59180    .44030    .00000    .45020    .00000    .00000
  .902     60.180   15.90650   22.18460   -3.33270    -.18800   -.58435    .31210    .00000    .45290    .00000    .00000
  .902     64.140   16.54150   21.44260   -2.83990     .33380   -.57930    .29900    .00000    .46090    .00000    .00000
  .902     68.070   16.86550   19.08700   -2.89550     .26110   -.59470    .39770    .00000    .47420    .00000    .00000
  .902     69.940   16.98220   18.06860   -2.89330     .18440   -.59530    .43690    .00000    .47970    .00000    .00000
  .902     60.190   16.00710   22.30050   -3.25620    -.11190   -.58990    .32910    .00000    .45290    .00000    .00000
          GRADIENT    .18541    -.01650     .08766     .05332    -.00105   -.03995    .00000    .00132    .00000    .00000

                          RUN NO.   88/ 0   RN/L =   6.65   GRADIENT INTERVAL =  -5.00/  5.00

 MACH      ALPHA      CNM        CLMM        CYM        CYNM       CBL        CA        CAB       XCP/L      CPB1      CPB2
 1.197     50.160   15.43970   15.543     -2.46590     .37540   -.69390   1.10660    .00000    .49440    .00000    .00000
 1.197     52.070   16.17750   15.95      -2.48400     .22690   -.69380   1.09230    .00000    .49610    .00000    .00000
 1.197     56.080   17.51490   16.314..   -2.59620     .12560   -.71200    .98330    .00000    .49050    .00000    .00000
 1.197     60.090   18.59990   16.78460   -2.43650    -.17250   -.71760    .92180    .00000    .49290    .00000    .00000
 1.197     64.060   19.54530   16.73610   -2.44490    -.26670   -.72670    .87050    .00000    .49670    .00000    .00000
 1.197     68.050   20.47670   16.30010   -2.52740    -.29060   -.74250    .77350    .00000    .50160    .00000    .00000
 1.197     69.930   20.76120   15.80690   -2.54200    -.38370   -.75520    .72560    .00000    .50440    .00000    .00000
 1.197     60.090   18.65150   16.88270   -2.42850    -.16440   -.71330    .91910    .00000    .49270    .00000    .00000
          GRADIENT    .26787     .01998    -.00139    -.03722    -.00328   -.01905    .00000    .00397    .00000    .00000
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                                                                                                  PAGE  22
DATE 08 NOV 74                  TABULATED SOURCE DATA,  MSFC TWT 590/595
                                                                                      (R95016)   ( 11 DEC 75  )
                                MSFC 590(SA26F) 142-IN. SRB(139) NBRE151 ELT
                                                                                    PARAMETRIC DATA
              REFERENCE DATA
                                                                          BETA   =      .000   PHI    =    90.000
SREF  =      .9030 SQ. IN   XMRP  =     5.5370 IN.                        FWDSTK =      .000   AFTSTK =      .000
LREF  =      .8000 IN.      YMRP  =      .0000 IN.                        ATHRNG =     1.000   ATHS   =      .000
BREF  =      .8000 IN.      ZMRP  =      .0000 IN.                        CONFIG =     3.000   SHDSTK =      .000
SCALE =      .0036                                                        ELT    =     1.000   SEPRKT =     1.000

                          RUN NO.   57/ 0    RN/L =   7.05   GRADIENT INTERVAL =  -5.00/  5.00

  MACH      ALPHA      CNM        CLMM        CYM        CYNM       CBL        CA         CAB       XCP/L      CFB1       CFB2
  1.951     49.940   15.11600    9.33670   -1.49580     .06410    -.68180    1.31390     .00000     .51610     .00000     .00000
  1.951     51.850   15.87970    9.69300   -1.54740    -.04480    -.69350    1.28970     .00000     .51610     .00000     .00000
  1.951     55.870   16.95500   10.47360   -1.70710    -.17420    -.73530    1.24540     .00000     .51610     .00000     .00000
  1.951     59.850   18.02820   10.80210   -1.85880    -.34370    -.75730    1.20550     .00000     .51770     .00000     .00000
  1.951     63.910   19.10870   11.38770   -1.94290    -.46840    -.77660    1.11250     .00000     .51710     .00000     .00000
  1.951     67.910   19.97610   11.85390   -2.00900    -.46010    -.77320    1.05650     .00000     .51810     .00000     .00000
  1.951     69.810   20.31360   11.79820   -2.03650    -.46670    -.76140    1.00850     .00000     .51920     .00000     .00000
  1.951     59.870   17.93660   10.82460   -1.83810    -.32550    -.75030    1.19800     .00000     .51920     .00000     .00000
          GRADIENT     .26427     .12906    -.02795    -.02730    -.00445    -.01517     .00000     .00314     .00000     .00000

                          RUN NO.  103/ 0    RN/L =   7.14   GRADIENT INTERVAL =  -5.00/  5.00

  MACH      ALPHA      CNM        CLMM        C:M        CYNM       CBL        CA         CAB       XCP/L      CFB1       CFB2
  3.479     49.760   13.61700    6.61520    -.82240    -.03360    -.58590    1.42140     .00000     .52690     .00000     .00000
  3.479     51.670   14.23320    7.04020    -.84680    -.01690    -.61330    1.42600     .00000     .52620     .00000     .00000
  3.479     55.670   15.44790    7.87970    -.91100    -.01430    -.65030    1.42130     .00000     .52490     .00000     .00000
  3.479     59.710   16.57310    8.68360    -.96590    -.07920    -.70330    1.37570     .00000     .52390     .00000     .00000
  3.479     63.720   17.55570    9.66830    -.98160    -.29880    -.68100    1.25390     .00000     .52160     .00000     .00000
  3.479     67.750   18.39380   10.25830    -.99860    -.35290    -.65820    1.11360     .00000     .52100     .00000     .00000
  3.479     69.650   18.75910   10.44360   -1.01870    -.39780    -.65850    1.04640     .00000     .52110     .00000     .00000
  3.479     59.710   16.56420    8.65790    -.96980    -.08690    -.70350    1.37430     .00000     .52390     .00000     .00000
          GRADIENT     .25890     .19790    -.00962    -.02077    -.00336    -.01924     .00000    -.00031     .00000     .00000
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                                   MSFC 590(SA26F) 142-IN. SRB(139) NBREISE ELT                    (R95017)   ( 11 DEC 73 )

             REFERENCE DATA                                                                   PARAMETRIC DATA

SREF  =      .5030 SQ. IN   XMRP  =      5.5570 IN.                             BETA   =      .000  PHI     =   135.000
LREF  =      .8000 IN.      YMRP  =       .0000 IN.                             FWDSTK =      .000  AFTSTK  =      .000
BREF  =      .8000 IN.      ZMRP  =       .0000 IN.                             ATHRNG =     1.000  ATHS    =      .000
SCALE =      .0035                                                              CONFIG =     3.000  SHDSTK  =      .000
                                                                                ELT    =     1.000  SEPRKT  =     1.000

                         RUN NO.    91/ 0    RN/L =    4.94    GRADIENT INTERVAL =  -5.00/  5.00

 MACH     ALPHA       CNM        CLMM        CYM        CYNM       CBL         CA         CAB        XCP/L      CPB1       CPB2
  .596    49.810    7.20790    9.60770   -1.64080    2.26840   -.75580     .37240     .00000     .45780     .00000     .00000
  .596    51.720    7.80940   10.32490   -1.68630    3.03430   -.79450     .29390     .00000     .45970     .00000     .00000
  .596    55.740    9.01360   11.59640   -2.22380    6.30260   -.83100     .17150     .00000     .46160     .00000     .00000
  .596    59.760   10.76970   13.26140   -1.46400    3.28980   -.86170    -.02380     .00000     .46610     .00000     .00000
  .596    63.760   11.41950   14.11680    -.17320    3.31160   -.91220     .14610     .00000     .46570     .00000     .00000
  .596    67.770   12.09150   13.78300     .49620    4.93050   -.93860    -.16210     .00000     .47360     .00000     .00000
  .596    69.670   12.31540   13.82890     .61070    4.66680   -.96070    -.09100     .00000     .47490     .00000     .00000
  .596    59.760   10.77300   13.39960   -1.53660    3.32660   -.87160    -.02130     .00000     .46510     .00000     .00000
         GRADIENT    .26454     .22283     .13421     .07548   -.00982    -.02663     .00000     .00085     .00000     .00000

                         RUN NO.    92/ 0    RN/L =    8.26    GRADIENT INTERVAL =  -5.00/  5.00

 MACH     ALPHA       CNM        CLMM        CYM        CYNM       CBL         CA         CAB        XCP/L      CPB1       CPB2
  .905    50.080   11.19740   15.20570     .73140    3.47160   -.72320     .57990     .00000     .45580     .00000     .00000
  .905    52.040   11.81580   16.81180    1.42160    2.61800   -.74910     .51370     .00000     .45050     .00000     .00000
  .905    56.050   12.99680   18.28220    1.55720    3.86400   -.79310     .38170     .00000     .45180     .00000     .00000
  .905    60.100   13.68880   19.00720    1.95200    3.71090   -.83390     .28000     .00000     .45490     .00000     .00000
  .905    64.080   14.44590   18.62670    2.46500    3.71290   -.88050     .19030     .00000     .46140     .00000     .00000
  .905    68.020   14.73270   16.97460    2.84170    3.10470   -.91460     .20540     .00000     .47260     .00000     .00000
  .905    69.900   14.89720   16.60620    2.92310    2.99810   -.93380     .29470     .00000     .47560     .00000     .00000
  .905    60.100   13.79940   18.93050    1.95370    3.74370   -.82720     .27240     .00000     .45460     .00000     .00000
         GRADIENT    .18494     .04754     .10307    -.00374   -.01056    -.01706     .00000     .00115     .00000     .00000

                         RUN NO.    93/ 0    RN/L =    8.66    GRADIENT INTERVAL =  -5.00/  5.00

 MACH     ALPHA       CNM        CLMM        CYM        CYNM       CBL         CA         CAB        XCP/L      CPB1       CPB2
 1.203    50.100   13.42940   13.57940    2.11160    1.20810   -.74050    1.01840     .00000     .43410     .00000     .00000
 1.203    52.010   14.25260   14.14410    2.06850    1.21180   -.75910     .95560     .00000     .48560     .00000     .00000
 1.203    56.020   15.34620   14.57220    2.17950    1.08760   -.78840     .84310     .00000     .48910     .00000     .00000
 1.203    60.040   16.44510   15.30720    2.25840    1.26050   -.80800     .79320     .00000     .49060     .00000     .00000
 1.203    64.000   17.20730   14.91450    2.35770    1.31640   -.83010     .78180     .00000     .49590     .00000     .00000
 1.203    67.990   18.00610   14.26250    2.45630    1.42260   -.85200     .75590     .00000     .50190     .00000     .00000
 1.203    69.870   18.25640   13.77270    2.47150    1.35420   -.86130     .71700     .00000     .50490     .00000     .00000
 1.203    60.030   16.49880   15.42880    2.28210    1.19290   -.79930     .79420     .00000     .49030     .00000     .00000
         GRADIENT    .23856     .01220     .02075     .01137   -.00[illegible]    -.01359     .00000     .00102     .00000     .00000
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MSFC 590(SA26F) 142-IN. SRB(139) NBRE181 ELT (R95017) (11 DEC 73)

REFERENCE DATA

SREF = .5030 SQ. IN XMRP = 5.5570 IN.
LREF = .8000 IN. YMRP = .0000 IN.
BREF = .8000 IN. ZMRP = .0000 IN.
SCALE = .0036

PARAMETRIC DATA

BETA = .000 PHI = 135.000
FWDSTK = .000 AFTSTK = .000
ATHRNG = 1.000 ATHS = .000
CONFIG = 3.000 SHDSTK = .000
ELT = 1.000 SEPRKT = 1.000

RUN NO. 58/ 0 RN/L = 7.07 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CPB1	CPB2
1.947	49.930	13.67200	8.98330	1.46270	.03160	-.65210	1.21520	.00000	.51290	.00000	.00000
1.947	51.840	14.06360	9.22410	1.52560	.12020	-.68120	1.18670	.00000	.51300	.00000	.00000
1.947	55.850	15.13600	9.64000	1.62330	.30220	-.70180	1.15060	.00000	.51460	.00000	.00000
1.947	59.860	16.19360	10.03790	1.76210	.51140	-.74610	1.10420	.00000	.51600	.00000	.00000
1.947	63.890	17.07060	10.73690	1.85610	.58550	-.76270	1.02660	.00000	.51520	.00000	.00000
1.947	67.890	18.01160	11.08890	1.89820	.68750	-.77920	.97470	.00000	.51630	.00000	.00000
1.947	69.730	18.27360	10.99750	1.90360	.74610	-.78330	.92680	.00000	.51740	.00000	.00000
1.947	59.850	16.06900	9.77710	1.75270	.53230	-.73230	1.10130	.00000	.51690	.00000	.00000
	GRADIENT	.23770	.10990	.02317	.03568	-.00698	-.01413	.00000	.00021	.00000	.00000

RUN NO. 102/ 0 RN/L = 7.13 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CPB1	CPB2
3.479	49.760	12.91350	8.17210	1.33120	-.33520	-.69390	1.37360	.00000	.52750	.00000	.00000
3.479	51.670	13.48580	8.82760	1.37300	-.27730	-.71240	1.37020	.00000	.52520	.00000	.00000
3.479	55.700	14.61960	7.94500	1.45330	-.15440	-.73420	1.36870	.00000	.52220	.00000	.00000
3.479	59.720	15.60990	8.88920	1.54010	-.01230	-.73190	1.32110	.00000	.52010	.00000	.00000
3.479	63.720	16.55510	9.67810	1.61910	.10370	-.74460	1.20150	.00000	.51880	.00000	.00000
3.479	67.750	17.41070	10.25530	1.69090	.25190	-.77220	1.06330	.00000	.51850	.00000	.00000
3.479	69.640	17.73060	10.35970	1.71690	.32460	-.77330	.99700	.00000	.51890	.00000	.00000
3.479	59.720	15.61930	8.93650	1.54000	-.02260	-.73750	1.31860	.00000	.51990	.00000	.00000
	GRADIENT	.24238	.21208	.01955	.03300	-.00365	-.01916	.00000	-.00043	.00000	.00000

MSFC 590(8A26F) 142-IN. SRB(138) NBRE151 ELT (RS5010) (11 DEC 73)

REFERENCE DATA

SREF = .5030 SQ. IN XMRP = 5.5570 IN.
LREF = .6000 IN. YMRP = .0000 IN.
BREF = .6000 IN. ZMRP = .0000 IN.
SCALE = .0056

PARAMETRIC DATA

BETA = .000 PHI = 45.000
FWDSTK = .000 AFTSTK = .000
ATHRNG = 1.000 ATHS = .000
CONFIG = 3.000 SHDSTK = .000
ELT = 1.000 SEPRKT = 1.000

RUN NO. 78/ 0 RN/L = 4.94 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CPB1	CPB2
.595	79.990	12.71950	10.00600	.00110	.02680	-.02850	.14440	.00000	.50240	.00000	.00000
.595	81.880	12.71680	9.45960	-.04240	.17120	.00420	.28910	.00000	.50590	.00000	.00000
.595	85.830	12.82720	8.12250	-.27640	1.60740	-.02760	.32880	.00000	.51490	.00000	.00000
.595	89.810	12.99380	5.85480	-.17490	.84390	-.04360	.47660	.00000	.52970	.00000	.00000
.595	93.780	12.97030	4.51070	-.22690	.91970	-.02280	.51640	.00000	.53820	.00000	.00000
.595	97.750	12.81510	2.80200	-.27580	1.69490	-.03010	.44070	.00000	.54970	.00000	.00000
.595	99.640	12.89010	2.47360	-.31150	1.76440	-.05390	.32450	.00000	.55090	.00000	.00000
.595	89.810	13.03570	5.90880	-.14410	.82450	-.04060	.47240	.00000	.52960	.00000	.00000
	GRADIENT	.00858	-.40288	-.01349	.07435	-.00143	.01060	.00000	.00259	.00000	.00000

RUN NO. 77/ 0 RN/L = 6.26 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CPB1	CPB2
.901	80.180	15.84400	13.22300	.12460	-.50980	-.01740	.45100	.00000	.49850	.00000	.00000
.901	82.040	15.97620	12.05740	.11390	-.30460	-.00570	.48520	.00000	.50500	.00000	.00000
.901	85.900	16.34050	8.57750	.10760	.05660	-.01260	.53090	.00000	.52370	.00000	.00000
.901	89.850	16.68300	6.41670	.15520	-.05950	.00520	.55430	.00000	.53520	.00000	.00000
.901	93.770	16.43773	4.56740	.16680	-.00810	.00600	.48620	.00000	.54390	.00000	.00000
.901	97.710	16.26260	2.38360	.10090	.02210	-.01900	.34740	.00000	.55460	.00000	.00000
.901	99.580	16.08200	1.36600	.04590	.20380	-.03990	.24740	.00000	.55960	.00000	.00000
.901	89.850	16.51230	6.36650	.15440	-.04480	-.01090	.55140	.00000	.53510	.00000	.00000
	GRADIENT	.01434	-.60403	-.00186	.02695	-.00070	-.00948	.00000	.00310	.00000	.00000

RUN NO. 76/ 0 RN/L = 6.65 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CPB1	CPB2
1.195	80.160	19.13190	12.04330	-.04910	-.36190	-.14450	.57090	.00000	.51520	.00000	.00000
1.195	82.070	19.31110	11.64320	-.06080	-.34780	-.14450	.55440	.00000	.51740	.00000	.00000
1.195	85.990	19.72060	9.84190	-.05760	-.04370	-.15440	.48470	.00000	.52580	.00000	.00000
1.195	89.940	19.82090	8.83670	-.14150	.11980	-.16010	.36230	.00000	.53020	.00000	.00000
1.195	93.900	20.09820	8.38800	-.18320	.20640	-.18020	.19640	.00000	.53250	.00000	.00000
1.195	97.890	19.79880	7.66940	-.17900	.26210	-.15760	.01830	.00000	.53490	.00000	.00000
1.195	99.770	19.39650	6.99990	-.17450	.30550	-.14310	-.04940	.00000	.53710	.00000	.00000
1.195	89.960	19.86480	9.32610	-.13140	.04330	-.15710	.35050	.00000	.52820	.00000	.00000
	GRADIENT	.02273	-.24848	-.00763	.03544	-.00055	-.03290	.00000	.00159	.00000	.00000

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                              MSFC 590(SA26F) 142-IN. SRB(139) NBRE1S1 ELT                 (R95018)   ( 11 DEC 73  )

           REFERENCE DATA                                                                   PARAMETRIC DATA

SREF  =      .5030 SQ. IN   XMRP  =     5.5570 IN.                        BETA    =      .000   PHI     =    45.000
LREF  =      .8000 IN.      YMRP  =      .0000 IN.                        FWDSTK  =      .000   AFTSTK  =      .000
BREF  =      .8000 IN.      ZMRP  =      .0000 IN.                        ATHRNG  =     1.000   ATHS    =      .000
SCALE =      .0056                                                        CONFIG  =     3.000   SHDSTK  =      .000
                                                                          ELT     =     1.000   SEPRKT  =     1.000

                        RUN NO.   53/ 0    RN/L =   7.16    GRADIENT INTERVAL =  -5.00/  5.00

  MACH      ALPHA      CNM        CLMM        CYM        CYNM       CBL        CA         CAB        XCP/L      CPB1       CPB2
  1.965     80.130   19.83370   10.25090   -.18790    -.18430    -.17590     .61750     .00000     .52390     .00000     .00000
  1.965     82.020   19.81710   10.01830   -.20100    -.15090    -.17720     .56340     .00000     .52530     .00000     .00000
  1.965     86.000   19.94200    9.46940   -.19410    -.07420    -.17870     .44380     .00000     .52780     .00000     .00000
  1.965     89.960   19.96690    8.73070   -.19360    -.06300    -.18140     .32700     .00000     .53090     .00000     .00000
  1.965     93.930   19.80570    8.01430   -.17410    -.05760    -.16940     .18940     .00000     .53350     .00000     .00000
  1.965     97.890   19.50770    7.07330   -.21180     .02650    -.16330     .06100     .00000     .53700     .00000     .00000
  1.965     99.770   19.38160    6.63090   -.22190     .03770    -.16500    -.00570     .00000     .53860     .00000     .00000
  1.965     89.960   19.90790    8.73270   -.19870    -.03700    -.17090     .32460     .00000     .53080     .00000     .00000
          GRADIENT    -.01560    -.18468   -.00097     .01043     .00073    -.03169     .00000     .00074     .00000     .00000

                        RUN NO.  107/ 0    RN/L =   7.16    GRADIENT INTERVAL =  -5.00/  5.00

  MACH      ALPHA      CNM        CLMM        CYM        CYNM       CBL        CA         CAB        XCP/L      CPB1       CPB2
  3.479     80.040   18.72340   10.05980   -.06490    -.07550    -.14150     .68550     .00000     .52270     .00000     .00000
  3.479     81.930   18.89850    9.85900   -.05590    -.07740    -.14180     .61670     .00000     .52400     .00000     .00000
  3.479     85.900   19.16050    9.40310   -.06760    -.05740    -.13200     .46720     .00000     .52650     .00000     .00000
  3.479     89.890   19.29590    8.71370   -.06490    -.02370    -.13220     .30930     .00000     .52970     .00000     .00000
  3.479     93.850   19.24590    8.07830   -.07190    -.02660    -.13460     .13770     .00000     .53230     .00000     .00000
  3.479     97.850   18.95610    7.40190   -.08490    -.05890    -.13920    -.03900     .00000     .53470     .00000     .00000
  3.479     99.750   18.76650    7.08390   -.08980    -.05810    -.12870    -.12010     .00000     .53570     .00000     .00000
  3.479     89.890   19.27800    8.68260   -.07280    -.04450    -.13290     .30800     .00000     .52980     .00000     .00000
          GRADIENT     .00346    -.15360   -.00140     .00125     .00039    -.04104     .00000     .00067     .00000     .00000
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MSFC 590(SA28F; 142-IN. SRB(130) NBRE1S1 ELT (R05019) (11 DEC 73)

REFERENCE DATA

SREF = .5030 SQ. IN XMRP = 5.5570 IN.
LREF = .8000 IN. YMRP = .0000 IN.
BREF = .8000 IN. ZMRP = .0000 IN.
SCALE = .0058

PARAMETRIC DATA

BETA = .000 PHI = 90.000
FWDSTK = .000 AFTSTK = .000
ATHRNG = 1.000 ATHS = .000
CONFIG = 3.000 SHDSTK = .000
ELT = 1.000 SEPRKT = 1.000

RUN NO. 85/ 0 P[illegible] = 4.96 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CPB1	CPB2
.599	80.060	14.92780	13.65480	-3.82630	1.59900	-.54890	.25970	.00000	.49190	.00000	.00000
.599	81.930	14.96790	12.34570	-3.79010	1.11820	-.54950	.31620	.00000	.49930	.00000	.00000
.599	85.850	14.88930	9.39100	-3.86910	.54670	-.56750	.38400	.00000	.51510	.00000	.00000
.599	89.820	15.07620	6.92090	-3.84560	.82560	-.55920	.41480	.00000	.52910	.00000	.00000
.599	93.780	15.26880	4.73390	-3.74320	.71000	-.59020	.44000	.00000	.54120	.00000	.00000
.599	97.740	15.30150	2.97100	-3.86300	.72810	-.61320	.29360	.00000	.55070	.00000	.00000
.599	99.620	15.15920	1.87620	-3.95070	.99130	-.59810	.21470	.00000	.55640	.00000	.00000
.599	89.820	15.10560	6.89870	-3.87860	.88850	-.56750	.42150	.00000	.52930	.00000	.00000
	GRADIENT	.01842	-.59755	-.00373	-.02337	-.00309	-.00116	.00000	.00328	.00000	.00000

RUN NO. 86/ 0 RN/L = 6.24 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CPB1	CPB2
.898	80.200	17.62925	14.20370	-2.85340	-.24670	-.64210	.49390	.00000	.50080	.00000	.00000
.898	82.070	17.67850	13.15620	-2.86680	-.27930	-.64870	.47870	.00000	.50580	.00000	.00000
.898	85.980	17.83440	10.67070	-2.85950	-.32760	-.66310	.46950	.00000	.51770	.00000	.00000
.898	89.8[illegible]	18.12650	8.00150	-2.83210	-.19980	-.66020	.52340	.00000	.53050	.00000	.00000
.898	93.790	18.11980	5.65560	-2.83240	.11160	-.66640	.46520	.00000	.54110	.00000	.00000
.898	97.730	17.93610	3.10090	-2.84660	.20350	-.66520	.33600	.00000	.55240	.00000	.00000
.898	99.590	17.81450	1.88790	-2.85960	.40820	-.67590	.23220	.00000	.55790	.00000	.00000
.898	89.890	18.11400	8.00380	-2.83100	-.21320	-.66460	.51790	.00000	.53050	.00000	.00000
	GRADIENT	.01443	-.63828	.00060	.03473	-.00138	-.01077	.00000	.00295	.00000	.00000

RUN NO. 87/ 0 RN/L = 6.66 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CPB1	CPB2
1.202	80.200	21.17550	12.89100	-2.59470	-.44700	-.74980	.58940	.00000	.51690	.00000	.00000
1.202	82.080	21.27460	12.44690	-2.58510	-.56380	-.76510	.57230	.00000	.51880	.00000	.00000
1.202	86.010	21.60190	11.28940	-2.63330	-.53090	-.77830	.52490	.00000	.52390	.00000	.00000
1.202	89.950	21.66920	10.04580	-2.66870	-.45930	-.78490	.39930	.00000	.52870	.00000	.00000
1.202	93.900	21.76570	8.60040	-2.67410	-.44030	-.79050	.23330	.00000	.53430	.00000	.00000
1.202	97.960	21.63140	7.30370	-2.68060	-.40980	-.77190	.03830	.00000	.53990	.00000	.00000
1.202	99.740	21.46670	6.74510	-2.66580	-.40400	-.76060	-.06530	.000[illegible]	.54090	.00000	.00000
1.202	89.970	21.60690	9.85260	-2.65320	-.45970	-.78170	.39940	.00000	.5293[illegible]	.00000	.00000
	GRADIENT	.01819	-.32[illegible]	-.00464	.00577	-.00060	-.03394	.00000	.00125	.00000	.00000

MSFC 590(SA26F) 142-IN. SRB(139) NBRE1S1 ELT (R95019) (11 DEC 73)

REFERENCE DATA

SREF = .3030 SQ. IN XMRP = 5.5570 IN.
LREF = .8000 IN. YMRP = .0000 IN.
BREF = .8000 IN. ZMRP = .0000 IN.
SCALE = .0036

PARAMETRIC DATA

BETA = .000 PHI = 90.000
FWDSTK = .090 AFTSTK = .000
ATHRNG = 1.000 ATHS = .000
CONFIG = 3.000 SHDSTK = .500
ELT = 1.000 SEFFKT = 1.500

RUN NO. 56/ 0 RN/L = 7.06 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CPB1	CPB2
1.954	80.140	21.56040	10.65440	-2.08530	-.59590	-.77380	.68820	.00000	.52620	.00000	.00000
1.954	82.030	21.73580	10.44560	-2.08860	-.58740	-.78220	.63140	.00000	.52730	.00000	.00000
1.954	85.990	21.91430	9.78330	-2.13740	-.58720	-.78270	.51080	.00000	.53010	.00000	.00000
1.954	89.970	21.81970	9.26030	-2.15730	-.69370	-.78010	.38160	.00000	.53190	.00000	.00000
1.954	93.940	21.79690	8.67100	-2.13920	-.75840	-.77980	.23190	.00000	.53410	.00000	.00000
1.954	97.900	21.48950	7.81060	-2.16140	-.74320	-.77860	.09250	.00000	.53690	.00000	.00000
1.954	99.790	21.28790	7.41210	-2.15270	-.77590	-.77830	.01750	.00000	.53910	.00000	.00000
1.954	89.970	21.82510	9.30160	-2.14950	-.69050	-.77470	.37530	.00000	.53180	.00000	.00000
	GRADIENT	-.01454	-.16311	-.00356	-.01051	-.00001	-.03415	.00000	.00060	.00000	.00000

RUN NO. 104/ 0 RN/L = 7.14 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CPB1	CPB2
3.479	80.050	20.00110	10.63850	-1.02800	-.45180	-.64330	.72820	.00000	.52310	.00000	.00000
3.479	81.940	20.18560	10.45130	-1.02540	-.41530	-.65340	.65020	.00000	.52430	.00000	.00000
3.479	85.920	20.43710	9.89410	-1.02660	-.43145	-.64290	.49360	.00000	.52705	.00000	.00000
3.479	89.900	20.53710	9.25450	-1.02860	-.42200	-.61630	.32910	.00000	.52990	.00000	.00000
3.479	93.860	20.45080	8.52030	-1.02730	-.37260	-.63370	.15110	.00000	.53250	.00000	.00000
3.479	97.870	20.21590	8.07120	-1.02840	-.36530	-.64090	-.03170	.00000	.53430	.00000	.00000
3.479	99.750	20.03370	7.55880	-1.02870	-.34140	-.65200	-.10680	.00000	.53580	.00000	.00000
3.479	89.900	20.52830	9.25920	-1.02480	-.41410	-.62550	.32870	.00000	.52970	.00000	.00000
	GRADIENT	.00174	-.15533	-.00010	.00488	.00014	-.04260	.00000	.00364	.00000	.00000

MSFC 590(SA26F) 142-IN. SRB(139) NBRE1S1 ELT (R95020) (11 DEC 73)

REFERENCE DATA

SREF = .5030 SQ. IN XMRP = 5.5570 IN.
LREF = .8000 IN. YMRP = .0000 IN.
BREF = .8000 IN. ZMRP = .0000 IN.
SCALE = .0058

PARAMETRIC DATA

BETA = .000 PHI = 135.000
FWDSTK = .000 AFTSTK = .000
ATHRNG = 1.000 ATHS = .000
CONFIG = 3.000 SHDSTK = .000
ELT = 1.000 SEPRKT = 1.000

RUN NO. 96/ 0 RN/L = 5.00 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CPB1	CPB2
.599	79.990	12.46680	10.01820	1.68390	5.11020	-.99650	.38850	.00000	.50100	.00000	.00000
.599	81.890	12.47620	9.09390	1.70910	4.51990	-1.00010	.41500	.00000	.50710	.00000	.00000
.599	85.930	12.65430	7.77900	1.91080	3.62410	-1.00860	.43930	.00000	.51640	.00000	.00000
.599	89.810	12.74060	5.87150	2.17030	1.73090	-.99900	.48910	.00000	.52890	.00000	.00000
.599	93.750	12.65600	3.94590	2.43740	1.32990	-1.00760	.49360	.00000	.54120	.00000	.00000
.599	97 40	12.54100	2.42760	2.46920	.12560	-.99450	.36220	.00000	.55970	.00000	.00000
.599	99.610	12.51280	1.69120	2.65570	.45590	-1.00500	.27020	.00000	.55550	.00000	.00000
.599	89.790	12.71610	5.90390	2.13100	1.68730	-1.00260	.50320	.00000	.52970	.00000	.00000
	GRADIENT	.00311	-.42829	.05047	-.25627	-.00010	-.00391	.00000	.00290	.00000	.00000

RUN NO. 95/ 0 RN/L = 6.33 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CPB1	CPB2
.893	80.180	15.45360	13.11650	3.12210	2.35580	-.98910	.44520	.00000	.49730	.00000	.00000
.893	82.050	15.55990	12.25370	3.13680	2.19260	-1.00380	.45710	.00000	.50230	.00000	.00000
.893	85.940	15.82380	9.76660	3.15140	1.97480	-1.01930	.48830	.00000	.51620	.00000	.00000
.893	89.880	16.02140	7.23730	3.24820	1.42790	-1.02440	.49400	.00000	.52970	.00000	.00000
.893	93.780	16.03840	4.87250	3.40850	.89330	-1.02130	.44580	.00000	.54170	.00000	.00000
.893	97.720	15.85330	2.41940	3.51600	.51230	-1.03540	.29460	.00000	.55410	.00000	.00000
.893	99.540	15.67420	1.27260	3.47190	.30230	-1.02430	.17820	.00000	.55990	.00000	.00000
.893	89.860	15.94860	7.18130	3.24150	1.40580	-1.02320	.48710	.00000	.52980	.00000	.00000
	GRADIENT	.01548	-.61857	.02161	-.10948	-.00175	-.01180	.00000	.00326	.00000	.00000

RUN NO. 94/ 0 RN/L = 6.73 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CPB1	CPB2
1.193	80.150	19.05580	11.13290	2.65130	1.11720	-.89700	.58830	.00000	.51890	.00000	.00000
1.193	82.010	19.24910	10.66390	2.64140	1.16820	-.90470	.59940	.00000	.52130	.00000	.00000
1.193	85.970	19.54230	9.90450	2.65690	1.05450	-.91110	.50580	.00000	.52520	.00000	.00000
1.193	89.930	19.76230	8.61270	2.68690	1.18210	-.90700	.39670	.00000	.53100	.00000	.00000
1.193	93.900	19.84900	8.28740	2.65530	1.09640	-.93410	.20980	.00000	.53250	.00000	.00000
1.193	97.890	19.59360	7.53270	2.59340	1.03300	-.89660	.00590	.00000	.53520	.00000	.00000
1.193	99.760	19.32290	7.12240	2.56410	.97160	-.88220	-.08730	.00000	.53650	.00000	.00000
1.193	89.520	19.72[illegible]	8.66780	2.66260	1.16480	-.90710	.39280	.00000	.53070	.00000	.00000
	GRADIENT	.01873	-.20177	-.00356	-.00668	.00068	-.03578	.00000	.00089	.00000	.00000

MSFC 590(SA26F) 142-IN. SRB(139) NBRE151 ELT (R95020) (11 DEC 73)

REFERENCE DATA

SREF = .3030 SQ. IN XMRP = 5.5570 IN.
LREF = .0000 IN. YMRP = .0000 IN.
BREF = .0000 IN. ZMRP = .0000 IN.
SCALE = .0036

PARAMETRIC DATA

BETA = .000 PHI = 135.000
FWDSTK = .000 AFTSTK = .000
ATHRNG = 1.000 ATHS = .000
CONFIG = 3.000 SHDSTK = .000
ELT = 1.000 SEPRKT = 1.000

RUN NO. 59/ 0 RN/L = 7.05 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CPB1	CPB2
1.954	80.130	19.44560	10.02930	2.01140	.77840	-.82250	.62550	.00000	.52450	.00000	.00000
1.954	82.020	19.56160	9.78150	2.01180	.79520	-.81580	.56720	.00000	.52570	.00000	.00000
1.954	85.980	19.86370	9.15890	2.03820	.80360	-.82690	.45770	.00000	.52890	.00000	.00000
1.954	89.950	19.83650	8.52360	2.05760	.75360	-.82970	.31680	.00000	.53150	.00000	.00000
1.954	93.920	19.73050	7.76380	2.04870	.66500	-.82190	.16990	.00000	.53440	.00000	.00000
1.954	97.870	19.44140	6.76160	2.00670	.63930	-.83230	.01120	.00000	.53920	.00000	.00000
1.954	99.760	19.32750	6.49130	2.00650	.56700	-.81920	-.06850	.00000	.53910	.00000	.00000
1.954	89.960	19.78190	8.75110	2.03680	.72600	-.82350	.29760	.00000	.53040	.00000	.00000
	GRADIENT	-.00754	-.18350	-.00013	-.01105	-.00022	-.03534	.00000	.00076	.00000	.00000

RUN NO. 101/ 0 RN/L = 7.12 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CPB1	CPB2
3.479	80.040	18.96940	10.24160	1.86460	.56760	-.82370	.68790	.00000	.52250	.00000	.00000
3.479	81.940	19.15230	10.01500	1.88550	.56240	-.82620	.61550	.00000	.52390	.00000	.00000
3.479	85.920	19.40590	9.47390	1.90690	.60350	-.83290	.46320	.00000	.52670	.00000	.00000
3.479	89.890	19.50690	8.77900	1.90080	.57440	-.83310	.29710	.00000	.52990	.00000	.00000
3.479	93.850	19.47160	7.90600	1.92320	.50430	-.83600	.10880	.00000	.53340	.00000	.00000
3.479	97.840	19.24360	7.04010	1.90040	.51250	-.82690	-.09790	.00000	.53670	.00000	.00000
3.479	99.730	19.02910	6.67950	1.87950	.48790	-.81640	-.19220	.00000	.53790	.00000	.00000
3.479	89.890	19.49780	8.75320	1.90040	.54800	-.84930	.29580	.00000	.52990	.00000	.00000
	GRADIENT	.00446	-.16463	.00094	-.00449	.00016	-.04476	.00000	.00090	.00000	.00000

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                         MSFC 590(SA26F) 142-IN. SRB(130) NORE181 ELT                (R05021)   ( 11 DEC 73  )

            REFERENCE DATA                                                              PARAMETRIC DATA

SREF  =      .5030 SQ. IN   XMRP  =     5.5570 IN.                       BETA    =      .000   PHI     =    45.000
LREF  =      .0000 IN.      YMRP  =      .0000 IN.                       FWDSTK  =      .000   AFTSTK  =      .000
BREF  =      .0000 IN.      ZMRP  =      .0000 IN.                       ATHRNG  =     1.000   ATHS    =      .000
SCALE =      .0036                                                       CONFIG  =     3.000   SHDSTK  =      .000
                                                                         ELT     =     1.000   SEPRKT  =     1.000

                              RUN NO.   64/ 0    RN/L =   4.98    GRADIENT INTERVAL =  -5.00/  5.00

  MACH      ALPHA      CNM       CLMM       CYM       CYNM       CBL       CA         CAB       XCP/L      CPB1      CPB2
   .598    130.170   6.28730  -6.11570  -1.64080   -.73250   -.13650  -1.84400    .00000    .64590    .00000    .00000
   .598    128.280   7.04170  -6.92700  -1.99390    .09840   -.13140  -1.73710    .00000    .64210    .00000    .00000
   .598    124.240   8.78900  -7.38170   -.45560    .15130   -.11440  -1.44400    .00000    .63500    .00000    .00000
   .598    120.230  10.31390  -6.69640   -.88700   -.28200   -.17700  -1.21360    .00000    .61950    .00000    .00000
   .598    116.280  11.20300  -4.38320   -.06000    .41690   -.19860   -.93090    .00000    .59840    .00000    .00000
   .598    112.290  11.73020  -2.97380    .56190    .28900   -.11930   -.57540    .00000    .58720    .00000    .00000
   .598    110.400  12.00360  -2.27460    .37030   -.24720   -.08410   -.43430    .00000    .58200    .00000    .00000
   .598    120.230  10.17320  -6.22620  -1.00730    .63020   -.16530  -1.31360    .00000    .61650    .00000    .00000
          GRADIENT   -.29238   -.22028   -.11622   -.02094   -.00076   -.07117    .00000    .00343    .00000    .00000

                              RUN NO.   65/ 0    RN/L =   6.29    GRADIENT INTERVAL =  -5.00/  5.00

  MACH      ALPHA      CNM       CLMM       CYM       CYNM       CBL       CA         CAB       XCP/L      CPB1      CPB2
   .900    129.950  10.39610  -7.37120   -.29050    .78230   -.08050  -1.73840    .00000    .62440    .00000    .00000
   .900    128.020  11.13610  -7.81180   -.05790    .77420   -.09730  -1.63740    .00000    .62360    .00000    .00000
   .900    124.010  12.47090  -7.63740    .10880   1.18380   -.10840  -1.37520    .00000    .61650    .00000    .00000
   .900    120.010  13.33500  -7.10060   -.08710   1.25940   -.10380  -1.15400    .00000    .61000    .00000    .00000
   .900    116.030  14.06010  -6.32930   -.00060   1.29660   -.08230   -.77660    .00000    .60320    .00000    .00000
   .900    112.050  14.62910  -5.46030   -.01460   1.01660   -.06120   -.45550    .00000    .59790    .00000    .00000
   .900    110.170  15.04410  -4.65650   -.02860   1.17210   -.04530   -.30060    .00000    .59190    .00000    .00000
   .900    120.010  13.44560  -7.21640   -.12520   1.23730   -.10790  -1.15290    .00000    .61030    .00000    .00000
          GRADIENT   -.22559   -.14304   -.00706   -.01763   -.00208   -.07335    .00000    .00166    .00000    .00000

                              RUN NO.   66/ 0    RN/L =   6.70    GRADIENT INTERVAL =  -5.00/  5.00

  MACH      ALPHA      CNM       CLMM       CYM       CYNM       CBL       CA         CAB       XCP/L      CFB1      CFB2
  1.201    130.020  13.08600  -2.19330   -.28860    .52620   -.13140  -1.93010    .00000    .58028    .00000    .00000
  1.201    128.120  13.72240  -1.94810   -.26780    .63840   -.13000  -1.81480    .00000    .57810    .00000    .00000
  1.201    124.140  15.03500  -1.00980   -.27150    .86220   -.13900  -1.52190    .00000    .57200    .00000    .00000
  1.201    120.170  15.91840    .14560   -.26160    .97680   -.14238  -1.30740    .00000    .56590    .00000    .00000
  1.201    116.230  16.89420   1.47540   -.26860    .87640   -.14840   -.99080    .00000    .55940    .00000    .00000
  1.201    112.230  17.54010   2.20920   -.25990    .87390   -.14490   -.66970    .00000    .55630    .00000    .00000
  1.201    110.330  17.73840   2.33530   -.22310    .74650   -.12390   -.51810    .00000    .55590    .00000    .00000
  1.201    120.170  15.90760    .28410   -.26290    .90690   -.14690  -1.30340    .00000    .56510    .00000    .00000
          GRADIENT   -.23815   -.24885   -.00205   -.01166    .00023   -.07143    .00000    .00132    .00000    .00000
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DATE 08 NOV 74                       TABULATED SOURCE DATA,  MSFC TWT 590/585                                        PAGE  38

                                      MSFC 590(SA26F) 142-IN. SRB(139) NBRE1S1 ELT                   (R95021)    ( 11 DEC 73  )

              REFERENCE DATA                                                                          PARAMETRIC DATA

SREF  =      .5030 SQ. IN   XMRP  =      3.5570 IN.                                   BETA    =      .000   PHI     =    45.000
LREF  =      .8000 IN.      YMRP  =       .0000 IN.                                   FWDSTK  =      .000   AFTSTK  =      .000
BREF  =      .8000 IN.      ZMRP  =       .0000 IN.                                   ATHRNG  =     1.000   ATHS    =      .000
SCALE =      .0036                                                                    CONFIG  =     3.000   SHDSTK  =      .000
                                                                                      ELT     =     1.000   SEPRKT  =     1.000

                         RUN NO.   63/ 0    RN/L =   7.04    GRADIENT INTERVAL =  -5.00/  5.00

   MACH      ALPHA      CNM        CLMM        CYM        CYNM        CBL        CA          CAB        XCP/L      CPB1       CPB2
   1.953    130.190   12.17460    1.51410    -.21770    -.11550    -.09360   -1.91880     .00000     .55640     .00000     .00000
   1.953    128.300   12.77850    1.82840    -.23630    -.19290    -.10010   -1.85780     .00000     .55490     .00000     .00000
   1.953    124.310   13.98320    2.99080    -.31290    -.20510    -.11940   -1.67400     .00000     .54910     .00000     .00000
   1.953    120.290   15.28850    3.19600    -.30500    -.17880    -.12680   -1.28550     .00000     .54950     .00000     .00000
   1.953    116.290   16.27870    3.62890    -.31280    -.06470    -.13330    -.98350     .00000     .54930     .00000     .00000
   1.953    112.290   17.03800    4.35770    -.27870    -.05150    -.13480    -.72030     .00000     .54570     .00000     .00000
   1.953    110.390   17.42980    4.55300    -.26970    -.04240    -.13150    -.58770     .00000     .54320     .00000     .00000
   1.953    120.320   15.04390    3.63560    -.29250    -.11190    -.12440   -1.34030     .00000     .54690     .00000     .00000
            GRADIENT   -.26774    -.14839     .00239    -.00679     .00199    -.07031     .00000     .00053     .00000     .00000

                                      MSFC 590(SA26F) 142-IN. SRB(139) NBRE1S1 ELT                   (R95022)    ( 11 DEC 73  )

              REFERENCE DATA                                                                          PARAMETRIC DATA

SREF  =      .5030 SQ. IN   XMRP  =      3.5570 IN.                                   BETA    =      .000   PHI     =    90.000
LREF  =      .8000 IN.      YMRP  =       .0000 IN.                                   FWDSTK  =      .000   AFTSTK  =      .000
BREF  =      .8000 IN.      ZMRP  =       .0000 IN.                                   ATHRNG  =     1.000   ATHS    =      .000
SCALE =      .0036                                                                    CONFIG  =     3.000   SHDSTK  =      .000
                                                                                      ELT     =     1.000   SEPRKT  =     1.000

                         RUN NO.   69/ 0    RN/L =   5.11    GRADIENT INTERVAL =  -5.00/  5.00

   MACH      ALPHA      CNM        CLMM        CYM        CYNM        CBL        CA          CAB        XCP/L      CPB1       CPB2
    .596    130.110   10.13380   -7.68280   -8.23420   -2.85480    -.58820   -1.77100     .00000     .62840     .00000     .00000
    .596    128.180   10.74870   -8.64900   -8.18720   -2.93240    -.59300   -1.65170     .00000     .61220     .00000     .00000
    .596    124.170   12.10600   -8.81340   -7.34210   -1.72060    -.59910   -1.42730     .00000     .62590     .00000     .00000
    .596    120.180   13.29080   -7.98120   -5.95130    -.17900    -.62290   -1.13810     .00000     .61550     .00000     .00000
    .596    116.220   13.79200   -6.73260   -5.16630    -.64130    -.59290    -.85290     .00000     .60530     .00000     .00000
    .596    112.210   14.19730   -5.73060   -4.37150     .31670    -.57290    -.52280     .00000     .59950     .00000     .00000
    .596    110.360   13.95000   -4.70920   -4.17750     .74790    -.56770    -.32820     .00000     .59410     .00000     .00000
    .596    120.190   12.94730   -7.36410   -5.81770    -.20540    -.61120   -1.19500     .00000     .61290     .00000     .00000
            GRADIENT   -.20325    -.17180    -.22359    -.18599    -.00109    -.07211     .00000     .00191     .00000     .00000
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                    MSFC 590(SA26F) 142-IN. SRB(139) NBRE1S1 ELT              (RS5022)    ( 11 DEC 73 )

        REFERENCE DATA                                                        PARAMETRIC DATA

SREF  =    .5030 SQ. IN   XMRP  =    5.5570 IN.                  BETA   =      .000  PHI    =   90.000
LREF  =    .6500 IN.      YMRP  =     .0000 IN.                  FLDSTK =      .000  AFTSTK =     .000
BREF  =    .6000 IN.      ZMRP  =     .0000 IN.                  ATHRNG =     1.000  ATMS   =     .000
SCALE =    .0056                                                 CONFIG =     5.000  SHDSTK =     .000
                                                                 ELT    =     1.000  SEPRAT =    1.000

                      RUN NO.   68/ 0   RN/L =   6.40   GRADIENT INTERVAL =  -5.00/  5.00

MACH    ALPHA     CNM       CLMM      CYM       CYNM      CBL       CA        CAB     XCP/L    CPB1    CPB2
 .901  129.870  12.16350  -8.78450  -3.71000   -.09550   -.59260  -1.74090   .00000  .62540  .00000  .00000
 .901  127.960  12.76810  -8.91890  -3.74970   -.67080   -.61720  -1.60470   .00000  .62350  .00000  .00000
 .901  123.970  13.96570  -8.23070  -3.59430  -1.03250   -.62300  -1.35360   .00000  .61460  .00000  .00000
 .901  119.990  14.89660  -7.23130  -3.28210   -.67070   -.55090  -1.13140   .00000  .60510  .00000  .00000
 .901  116.030  15.81100  -6.14760  -3.03780   -.53670   -.64230   -.79930   .00000  .59320  .00000  .00000
 .901  112.050  16.11890  -4.78280  -2.86130   -.01840   -.62350   -.44740   .00000  .59070  .00000  .00000
 .901  110.170  16.53630  -4.16160  -2.80540    .13030   -.53100   -.29520   .00000  .59710  .00000  .00000
 .901  119.980  14.96370  -7.22230  -3.23590   -.89410   -.63280  -1.13620   .00000  .60510  .00000  .00000
       GRADIENT  -.21890   -.24616   -.05165   -.02658    .00166   -.07292   .00000  .00200  .00000  .00000

                      RUN NO.   67/ 0   RN/L =   6.73   GRADIENT INTERVAL =  -5.00/  5.00

MACH    ALPHA     CNM       CLMM      CYM       CYNM      CBL       CA        CAB     XCP/L    CPB1    CPB2
1.201  129.960  14.82820  -2.97820  -2.58200   -.82100   -.66610  -1.93330   .00000  .59290  .00000  .00000
1.201  128.050  15.56640  -2.89390  -2.71450   -.91830   -.67930  -1.92770   .00000  .59170  .00000  .00000
1.201  124.080  16.82730  -1.97550  -2.64590   -.87770   -.71920  -1.59170   .00000  .57610  .00000  .00000
1.201  120.110  17.84740   -.42030  -2.74660   -.55530   -.71810  -1.37840   .00000  .55950  .00000  .00000
1.201  116.160  18.74860   1.16350  -2.74160   -.28370   -.72800  [illegible]  .00000  .55140  .00000  .00000
1.201  112.190  19.57450   2.28530  -2.74330   -.42790  [illegible]  -.71670   .00000  .55790  .00000  .00000
1.201  110.310  19.86120   2.69930  -2.73310   -.50530  [illegible] [illegible]  .00000  .55540  .00000  .00000
1.201  120.120  17.74550   -.30180  -2.73650   -.56850   -.71500  -1.37130   .00000  .55790  .00000  .00000
       GRADIENT  -.25372   -.31227    .00372   -.02668    .00310   -.06972   .00000  .00150  .00000  .00000

                      RUN NO.   62/ 0   RN/L =   7.01   GRADIENT INTERVAL =  -5.00/  5.00

MACH    ALPHA     CNM       CLMM      CYM       CYNM      CBL       CA        CAB     XCP/L    CPB1    CPB2
1.958  130.200  13.59420   2.68350  -1.70530   -.95280   -.56110  [illegible]  .00000  .55340  .00000  .00000
1.958  128.300  14.26380   2.92740  -1.79580   -.88280   -.58090  [illegible]  .00000  .54990  .00000  .00000
1.958  124.330  15.51230   4.08810  -1.92200   -.84900   -.62380  -1.65990   .00000  .54590  .00000  .00000
1.958  120.290  17.03160   3.90740  -2.12070  [illegible]  -.71720  -1.28210   .00000  .54790  .00000  .00000
1.958  116.300  17.95250   4.58840  -2.16950   -.67900   -.73530  [illegible]  .00000  .54573  .00000  .00000
1.958  112.310  18.89840   5.10530  -2.16700   -.77630   -.73760  [illegible]  .00000  .54453  .00000  .00000
1.958  110.410  19.20240   5.23300  -2.12890  [illegible]  -.73810  [illegible]  .00000  .54433  .00000  .00000
1.958  120.320  16.76200   4.38060  -2.06500   -.70910  [illegible] [illegible]  .00000  .54523  .00000  .00000
       GRADIENT  -.28757   -.12542    .02291   -.00983  [illegible] [illegible]  .00000  .00029  .00000  .00000
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MSFC 590(SA26F) 142-IN. SRB(139) NBRE181 ELT (R95023) (11 DEC 73)

REFERENCE DATA

SREF = .5030 SQ. IN XMRP = 5.5570 IN.
LREF = .8000 IN. YMRP = .0000 IN.
BREF = .8000 IN. ZMRP = .0000 IN.
SCALE = .0056

PARAMETRIC DATA

BETA = .000 PHI = 135.000
FWDSTK = .000 AFTSTK = .000
ATHRNG = 1.000 ATHS = .000
CONFIG = 3.000 SHDSTK = .000
ELT = 1.000 SEPRKT = 1.000

RUN NO. 70/ 0 RN/L = 4.92 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CFB1	CFB2
.597	130.140	7.53940	-7.00390	-3.74040	-3.42720	-.74210	-1.86860	.00000	.64230	.00000	.00000
.597	128.240	8.10630	-7.04370	-3.67560	-3.01820	-.76060	-1.77640	.00000	.63740	.00000	.00000
.597	124.230	9.62670	-6.97900	-1.36730	-5.30790	-.85260	-1.50550	.00000	.62570	.00000	.00000
.597	120.230	10.89590	-6.16240	-.85960	-4.97420	-.89640	-1.26020	.00000	.61270	.00000	.00000
.597	116.260	11.60360	-5.26370	-.13430	-4.10490	-.90990	-1.05800	.00000	.60390	.00000	.00000
.597	112.270	12.11610	-3.92620	.38560	-4.27570	-.93680	-.72180	.00000	.59390	.00000	.00000
.597	110.380	12.35650	-3.35200	.65120	-4.08580	-.94170	-.55210	.00000	.59870	.00000	.00000
.597	120.230	10.83130	-6.14910	-.79180	-4.67070	-.87890	-1.34400	.00000	.61280	.00000	.00000
	GRADIENT	-.24688	-.19118	-.22781	.03328	.01018	-.06547	.00000	.00274	.00000	.00000

RUN NO. 71/ 0 RN/L = 6.24 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CFB1	CFB2
.901	129.930	11.14580	-7.34340	.65040	-2.47930	-.71430	-1.84250	.00000	.62030	.00000	.00000
.901	128.06L	11.61940	-7.63300	.74870	-3.03910	-.73690	-1.69190	.00000	.62010	.00000	.00000
.901	124.020	12.70150	-7.83020	1.07980	-3.77550	-.78760	-1.39960	.00000	.61690	.00000	.00000
.901	120.020	13.37100	-7.06740	1.58130	-4.20200	-.83630	-1.15130	.00000	.60950	.00000	.00000
.901	116.040	14.04280	-6.11610	2.15570	-3.75550	-.88270	-.79740	.00000	.60210	.00000	.00000
.901	112.020	14.92950	-5.06910	2.44760	-2.68640	-.90840	-.49960	.00000	.59420	.00000	.00000
.901	110.160	15.22200	-4.25310	2.53190	-2.38230	-.92610	-.34950	.00000	.59930	.00000	.00000
.901	120.020	13.34590	-7.06880	1.58160	-4.27560	-.83140	-1.14670	.00000	.60970	.00000	.00000
	GRADIENT	-.23286	-.16272	-.15260	-.01071	.01082	-.07531	.00000	.00161	.00000	.00000

RUN NO. 72/ 0 RN/L = 6.65 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CFB1	CFB2
1.198	129.980	13.19310	-2.68970	1.74360	1.26430	-.71770	-2.11430	.00000	.58320	.00000	.00000
1.198	128.080	13.79150	-2.48680	1.84180	1.05080	-.73700	-1.99950	.00000	.58120	.00000	.00000
1.198	124.120	15.00060	-1.30500	1.98070	.72370	-.76350	-1.71010	.00000	.57360	.00000	.00000
1.198	120.160	16.05650	-.01210	2.12220	.60230	-.79720	-1.49600	.00000	.56650	.00000	.00000
1.198	116.210	17.56030	1.15410	2.31850	.65810	-.82890	-1.15910	.00000	.56100	.00000	.00000
1.198	112.220	17.74350	2.19250	2.45780	.37370	-.84290	-.80150	.00000	.55650	.00000	.00000
1.198	110.390	18.05040	2.93050	2.51100	.30130	-.94700	-.64480	.00000	.55330	.00000	.00000
1.198	120.160	16.06920	.01420	2.11650	.68900	-.73990	-1.49440	.00000	.56650	.00000	.00000
	GRADIENT	-.24953	-.29195	-.03937	.04317	.00678	-.07449	.00000	.00154	.00000	.00000

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                               MSFC 590(SA26F) 142-IN. SRB(130) NBRE1S1 ELT                (R95023)   ( 11 DEC 73  )

                 REFERENCE DATA                                                         PARAMETRIC DATA

SREF  =      .5030 SQ. IN   XMRP  =     5.5570 IN.                         BETA   =      .000   PHI    =   135.000
LREF  =      .8000 IN.      YMRP  =      .0000 IN.                         FWDSTK =      .000   AFTSTK =      .000
BREF  =      .8000 IN.      ZMRP  =      .0000 IN.                         ATHRNG =     1.000   ATHS   =      .000
SCALE =      .0056                                                         CONFIG =     3.000   SHDSTK =      .000
                                                                           ELT    =     1.000   SEPRKT =     1.000

                         RUN NO.   61/ 0    RN/L =   7.03    GRADIENT INTERVAL =  -5.00/  5.00

  MACH      ALPHA      CNM        CLMM       CYM        CYNM       CBL        CA         CAB        XCP/L      CPB1       CPB2
  1.952    130.160   12.56410    1.36200    1.28160     .93180    -.61000   -1.99610    .00000     .55770     .00000     .00000
  1.952    128.270   13.16850    1.76740    1.32950     .93120    -.63470   -1.94200    .00000     .55560     .00000     .00000
  1.952    124.310   14.36300    2.79000    1.47290     .74310    -.67370   -1.76130    .00000     .55070     .00000     .00000
  1.952    120.270   15.66150    3.00940    1.61200     .69030    -.71930   -1.41900    .00000     .55090     .00000     .00000
  1.952    1[illegible].270   16.60790    3.31530    1.71350     .62970    -.76060   -1.09730    .00000     .55020     .00000     .00000
  1.952    112.250   17.56080    3.77650    1.80460     .51410    -.76850    -.79190    .00000     .54900     .00000     .00000
  1.952    110.360   17.84020    4.06010    1.85110     .46890    -.79990    -.66750    .00000     .54900     .00000     .00000
  1.952    120.290   15.47520    3.31090    1.58030     .72650    -.72090   -1.45030    .00000     .54910     .00000     .00000
          GRADIENT    -.27008    -.12395    -.02920     .02295     .03971    -.07024    .00000     .00042     .00000     .00000

                               MSFC 590(SA26F) 142-IN. SRB(130) NBRE1S1 ELT                (R95024)   ( 11 DEC 73  )

                 REFERENCE DATA                                                         PARAMETRIC DATA

SREF  =      .5030 SQ. IN   XMRP  =     5.5570 IN.                         BETA   =      .000   PHI    =    45.000
LREF  =      .8000 IN.      YMRP  =      .0000 IN.                         FWDSTK =      .000   AFTSTK =      .000
BREF  =      .8000 IN.      ZMRP  =      .0000 IN.                         ATHRNG =     1.000   ATHS   =      .000
SCALE =      .0056                                                         CONFIG =     3.000   SHDSTK =      .000
                                                                           ELT    =     1.000   SEPRKT =     1.000

                         RUN NO.   45/ 0    RN/L =   5.01    GRADIENT INTERVAL =  -5.00/  5.00

  MACH      ALPHA      CNM        CLMM       CYM        CYNM       CBL        CA         CAB        XCP/L      CPB1       CPB2
   .595    169.790     .69130   -1.38970    -.32250    -.11060    -.01950   -1.43570    .00000     .73050     .00000     .00000
   .595    167.070     .93410   -1.56640    -.46430    -.28260    -.01710   -1.53590    .00000     .70330     .00000     .00000
   .595    163.800    1.58520   -1.60530    -.76520    -.30600    -.05400   -1.67070    .00000     .65940     .00000     .00000
   .595    159.740    2.24460   -1.69180    -.73300     .28120    -.09190   -1.82513    .00000     .62800     .00000     .00000
   .595    155.690    2.87280   -1.61260    -.57720    1.66220    -.12400   -2.03120    .00000     .61230     .00000     .00000
   .595    151.610    3.57200   -1.99290    -.51660    3.20210    -.12620   -2.21050    .00000     .61230     .00000     .00000
   .595    149.660    4.03470   -2.41060    -.50390    3.22830    -.11360   -2.28420    .00000     .61530     .00000     .00000
   .595    159.740    2.24200   -1.67750    -.77590     .31770    -.08380   -1.83340    .00000     .62760     .00000     .00000
          GRADIENT    -.16405     .03526     .00403    -.19021     .00576     .04212    .00000     .00569     .00000     .00000
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DATE 06 NOV 74                    TABULATED SOURCE DATA, MSFC TWT 590/595                                     PAGE   36

                                 MSFC 590(SA26F) 142-IN. SRB(139) NBRE1S1 ELT                  (R95024)   ( 11 DEC 73  )

             REFERENCE DATA                                                                       PARAMETRIC DATA

SREF  =       .5030 SQ. IN   XMRP  =     5.5570 IN.                               BETA   =      .000   PHI    =    45.000
LREF  =       .8000 IN.      YMRP  =      .0000 IN.                               FWDSTK =      .000   AFTSTK =      .000
BREF  =       .8000 IN.      ZMRP  =      .0000 IN.                               ATHRNG =     1.000   ATHS   =      .000
SCALE =       .0058                                                               CONFIG =     3.000   SHDSTK =      .000
                                                                                  ELT    =     1.000   SEPRKT =     1.000

                          RUN NO.   44/ 0   RN/L =   6.32   GRADIENT INTERVAL =  -5.00/  5.00

  MACH     ALPHA      CNM       CLMM      CYM       CYNM      CBL       CA        CAB      XCP/L     CPB1      CPB2
   .899   169.780    .64730    .34850   -.33280   -.80240   -.02140  -1.89160   .00000    .53300   .00000    .00000
   .899   167.820   1.16890    .09100   -.38200   -.70210   -.04360  -2.00590   .00000    .56020   .00000    .00000
   .899   163.690   1.69750   -.18390   -.92650   -.71010   -.09050  -2.14750   .00000    .57440   .00000    .00000
   .899   159.580   2.50430   -.55110   -.76430    .34200   -.09960  -2.26650   .00000    .58450   .00000    .00000
   .899   155.440   3.18470  -1.26710   -.45870   1.64500   -.10520  -2.35550   .00000    .59900   .00000    .00000
   .899   151.280   4.03240  -2.39030   -.25620   2.17350   -.07540  -2.42780   .00000    .61490   .00000    .00000
   .899   149.240   4.58440  -2.92630   -.12310   2.35400   -.07310  -2.46840   .00000    .61860   .00000    .00000
   .899   159.580   2.48030   -.53150   -.75510    .34600   -.10020  -2.26140   .00000    .59400   .00000    .00000
          GRADIENT   -.17648    .15364   -.01786   -.16731    .00222    .02687   .00000   -.00375   .00000    .00000

                          RUN NO.   43/ 0   RN/L =   6.70   GRADIENT INTERVAL =  -5.00/  5.00

  MACH     ALPHA      CNM       CLMM      CYM       CYNM      CBL       CA        CAB      XCP/L     CPB1      CPB2
  1.197   169.610   1.02480  -1.47840   -.42170   -.27740   -.05060  -2.51560   .00000    .68420   .00000    .00000
  1.197   167.640   1.29390  -1.74090   -.63770   -.29660   -.06970  -2.57710   .00000    .67630   .00000    .00000
  1.197   163.470   2.00890  -2.21740   -.94830   -.02250   -.09040  -2.64190   .00000    .65660   .00000    .00000
  1.197   159.230   3.00340  -3.01160   -.43360   1.74120   -.07920  -2.69080   .00000    .64830   .00000    .00000
  1.197   154.920   4.43670  -3.54450    .14430   1.99730   -.02620  -2.78170   .00000    .63170   .00000    .00000
  1.197   150.590   6.23680  -3.34100   -.25000    .05510   -.02700  -2.87160   .00000    .61020   .00000    .00000
  1.197   149.530   7.01050  -3.24940   -.48140   -.13830   -.08110  -2.89030   .00000    .60430   .00000    .00000
  1.197   159.220   3.02290  -3.03960   -.42620   1.79530   -.09120  -2.69400   .00000    .64950   .00000    .00000
          GRADIENT   -.20559    .09373   -.01818   -.03152   -.00069    .01722   00000     .00375   .00000    .00000

                          RUN NO.   46/ 0   RN/L =   7.19   GRADIENT INTERVAL =  -5.00/  5.00

  MACH     ALPHA      CNM       CLMM      CYM       CYNM      CBL       CA        CAB      XCP/L     CPB1      CPB2
  1.960   169.600    .95670  -1.27100   -.51890   -.29130   -.02220  -2.48900   .00000    .67490   .00000    .00000
  1.960   167.620   1.28150  -1.45300   -.63550   -.30930   -.03570  -2.52030   .00000    .65990   .00000    .00000
  1.960   163.390   2.33070  -1.50990   -.31790   1.00620   -.02830  -2.59880   .00000    .61940   .00000    .00000
  1.960   159.130   3.66970  -1.02090   -.04960   1.27800   -.02050  -2.68100   .00000    .58920   .00000    .00000
  1.960   154.830   5.05210   -.85250   -.22640    .29220   -.04210  -2.75460   .00000    .58030   .00000    .00000
  1.960   150.580   6.40890   -.21600   -.32900    .17330   -.08090  -2.76590   .00000    .56930   .00000    .00000
  1.960   148.530   7.26260    .24550   -.36910    .10480   -.07710  -2.81470   .00000    .56390   .00000    .00000
  1.960   159.150   3.65880   -.91520   -.05240   1.28880   -.03040  -2.64030   .00000    .58690   .00000    .00000
          GRADIENT   -.30164   -.07273   -.01127   -.01268    .00254    .01533   .00000    .00520   .00000    .00000
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                              MSFC 590(SA26F) 142-IN. SRB(139) NBRE1S1 ELT              (R95024)   ( 11 DEC 73  )

          REFERENCE DATA                                                                 PARAMETRIC DATA

SREF  =      .5030 SQ. IN   XMRP  =     5.5570 IN.                        BETA    =     .000   PHI     =    45.000
LREF  =      .6000 IN.      YMRP  =      .0000 IN.                        FWDSTK  =     .000   AFTSTK  =      .000
BREF  =      .6000 IN.      ZMRP  =      .0000 IN.                        ATHRNG  =    1.000   ATHS    =      .000
SCALE =      .0036                                                        CONFIG  =    3.000   SHDSTK  =      .000
                                                                          ELT     =    1.000   SEPRKT  =     1.000

                         RUN NO.   22/ 0    RN/L =   6.30    GRADIENT INTERVAL =  -5.00/  5.00

   MACH     ALPHA       CNM        CLMM       CYM       CYNM       CBL        CA        CAB       XCP/L      CPB1      CPB2
   3.479   169.770     .74410    -.41590   -.19140    .01740   -.00920  -2.43880    .00000    .61210    .00000    .00000
   3.479   167.850    1.04680    -.31140   -.20360    .14480   -.00580  -2.46850    .00000    .59080    .00000    .00000
   3.479   163.750    1.64020    -.02430   -.13140    .33190   -.01370  -2.53220    .00000    .56760    .00000    .00000
   3.479   159.610    2.75320     .26000   -.16240    .02680   -.01450  -2.64540    .00000    .55880    .00000    .00000
   3.479   155.470    3.80100     .51460   -.20240   -.05120   -.03420  -2.79780    .00000    .55550    .00000    .00000
   3.479   151.300    4.97400     .61880   -.22940   -.06040   -.03310  -2.85200    .00000    .55640    .00000    .00000
   3.479   149.290    5.63960     .16200   -.22580   -.07980   -.03880  -2.39890    .00000    .56420    .00000    .00000
   3.479   159.610    2.74440     .24880   -.16600    .02670   -.01420  -2.65110    .00000    .55910    .00000    .00000
           GRADIENT   -.23832    -.04149    .00227    .01127    .00161    .01013    .00000    .00216    .00000    .00000

                              MSFC 590(SA26F) 142-IN. SRB(139) NBRE1S1 ELT              (R95025)   ( 11 DEC 73  )

          REFERENCE DATA                                                                 PARAMETRIC DATA

SREF  =      .5030 SQ. IN   XMRP  =     5.5570 IN.                        BETA    =     .000   PHI     =    90.000
LREF  =      .6000 IN.      YMRP  =      .0000 IN.                        FWDSTK  =     .000   AFTSTK  =      .000
BREF  =      .6000 IN.      ZMRP  =      .0000 IN.                        ATHRNG  =    1.000   ATHS    =      .000
SCALE =      .0036                                                        CONFIG  =    3.000   SHDSTK  =      .000
                                                                          ELT     =    1.000   SEPRKT  =     1.000

                         RUN NO.   40/ 0    RN/L =   5.01    GRADIENT INTERVAL =  -5.00/  5.00

   MACH     ALPHA       CNM        CLMM       CYM       CYNM       CBL        CA        CAB       XCP/L      CPB1      CPB2
    .599   169.780     .94820    -.89380   -.24350    .12690   -.10440  -1.45250    .00000    .64350    .00000    .00000
    .599   167.850    1.28480   -1.00710   -.37330    .06320   -.10440  -1.55580    .00000    .63050    .00000    .00000
    .599   163.780    2.18330   -1.32370   -.64170   -.39160   -.15850  -1.67710    .00000    .61600    .00000    .00000
    .599   159.680    3.20130   -1.57300  -1.10690   -.71970   -.23090  -1.83130    .00000    .60660    .00000    .00000
    .599   155.570    4.08030   -1.80000  -2.10360   -.56090   -.29490  -2.03400    .00000    .60250    .00000    .00000
    .599   151.470    5.09570   -1.89980  -3.17400    .57060   -.29290  -2.26250    .00000    .59690    .00000    .00000
    .599   149.510    5.73330   -2.16830  -3.59820    .97800   -.33000  -2.30830    .00000    .59740    .00000    .00000
    .599   159.650    3.22020   -1.59090  -1.09670   -.72820   -.23880  -1.82420    .00000    .60680    .00000    .00000
           GRADIENT   -.23442     .05944    .16866   -.03244    .01185    .04267    .00000    .00213    .00000    .00000
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                              MSFC 590(SA26F) 142-IN. SRB(139) NBRE1S1 ELT            (R95025)   ( 11 DEC 73  )

            REFERENCE DATA                                                                 PARAMETRIC DATA

SREF  =     .5030 SQ. IN   XMRP  =    5.5570 IN.                            BETA   =     .000   PHI    =    90.000
LREF  =     .8000 IN.      YMRP  =     .0000 IN.                            FWDSTK =     .000   AFTSTK =      .000
BREF  =     .8000 IN.      ZMRP  =     .0000 IN.                            ATHRNG =    1.000   ATHS   =      .000
SCALE =     .0036                                                           CONFIG =    3.000   SHDSTK =      .000
                                                                            ELT    =    1.000   SEPRKT =     1.000

                        RUN NO.   41/ 0   RN/L =   6.32   GRADIENT INTERVAL =  -5.00/  5.00

  MACH     ALPHA      CNM       CLMM       CYM       CYNM       CBL       CA        CAB      XCP/L     CPB1     CPB2
   .897   169.780   1.13820    .90110   -.08080    .28360   -.09400  -1.89340   .00000    .50200   .00000   .00000
   .897   167.800   1.47770    .66080   -.18260    .20390   -.11100  -1.99170   .00000    .53010   .00000   .00000
   .897   163.640   2.41750    .01550   -.67600   -.19220   -.16090  -2.12660   .00000    .56600   .00000   .00000
   .897   159.450   3.30900   -.56830  -1.42640   -.33870   -.22120  -2.20940   .00000    .58050   .00000   .00000
   .897   155.280   4.32150  -1.41770  -2.30300   -.39130   -.27510  -2.33110   .00000    .59330   .00000   .00000
   .897   151.000   5.59770  -2.69540  -3.24700    .92630   -.31620  -2.47970   .00000    .60580   .00000   .00000
   .897   148.920   6.58440  -3.25460  -3.29700   2.31520   -.33650  -2.51970   .00000    .60680   .00000   .00000
   .897   159.440   3.34140   -.54850  -1.42640   -.32630   -.22220  -2.23200   .00000    .57990   .00000   .00000
          GRADIENT  -.25269    .19720    .16804   -.06772    .01202    .02918   .00000   -.00467   .00000   .00000

                        RUN NO.   42/ 0   RN/L =   6.76   GRADIENT INTERVAL =  -5.00/  5.00

  MACH     ALPHA      CNM       CLMM       CYM       CYNM       CBL       CA        CAB      XCP/L     CPB1     CPB2
  1.201   169.540   1.47200  -1.12200   -.42940    .12860   -.12770  -2.48210   .00000    .62870   .00000   .00000
  1.201   167.560   1.82900  -1.37850   -.62890   -.08320   -.14910  -2.54700   .00000    .62800   .00000   .00000
  1.201   163.330   2.81120  -1.89060   -.99590   -.45680   -.20910  -2.63080   .00000    .62140   .00000   .00000
  1.201   159.040   4.14310  -2.55520  -1.13420   -.51950   -.27260  -2.65920   .00000    .61680   .00000   .00000
  1.201   154.710   5.69070  [illegible]  -1.43090  -1.05040   -.33800  -2.71990   .00000    .60960   .00000   .00000
  1.201   150.360   7.65090  -2.69400  -1.56700  -1.87580   -.38630  -2.80750   .00000    .59530   .00000   .00000
  1.201   148.270   8.72480  -2.24950  -1.75120  -2.17880   -.41900  -2.84170   .00000    .58760   .00000   .00000
  1.201   159.030   4.18110  -2.54100  -1.18470   -.51480   -.26990  -2.65290   .00000    .61610   .00000   .00000
          GRADIENT  -.33982    .06798    .05931    .10355    .01384    .01568   .00000    .00187   .00000   .00000

                        RUN NO.   47/ 0   RN/L =   7.19   GRADIENT INTERVAL =  -5.00/  5.00

  MACH     ALPHA      CNM       CLMM       CYM       CYNM       CBL       CA        CAB      XCP/L     CPB1     CPB2
  1.952   169.385   1.18640   -.86360   -.36530   -.24820   -.08980  -2.51740   .00000    .62590   .00000   .00000
  1.952   167.595   1.59950   -.95760   -.46910   -.40170   -.11150  -2.54970   .00000    .61540   .00000   .00000
  1.952   163.343   2.75140  -1.17000   -.44900   -.53790   -.15870  -2.61810   .00000    .60120   .00000   .00000
  1.952   159.030   4.12980  -1.08010   -.69130   -.60980   -.20900  -2.70740   .00000    .59790   .00000   .00000
  1.952   154.660   5.71800  -1.09960   -.86850   -.68340   -.26920  -2.80590   .00000    .58220   .00000   .00000
  1.952   150.370   7.25710   -.48240  -1.03360   -.97200   -.32430  -2.82530   .00000    .57200   .00000   .00000
  1.952   148.320   8.06410   -.10790  -1.09260   -.78780   -.35040  -2.87250   .00000    .56760   .00000   .00000
  1.952   159.050   4.12520   -.95810   -.69850   -.63120   -.21670  -2.67760   .00000    .58550   .00000   .00000
          GRADIENT  -.32710   -.03030    .03500    .03053    .01234    .01690   .00000    .00261   .00000   .00000
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                                    MSFC 590(SA26F) 142-IN. SRB(139) NBRE1S1 ELT                    (R95D25)    ( 11 DEC 73  )

              REFERENCE DATA                                                                          PARAMETRIC DATA

SREF  =       .5030 SQ. IN   XMRP  =     5.5570 IN.                                       BETA    =       .000  PHI     =    90.000
LREF  =       .6000 IN.      YMRP  =      .0000 IN.                                       FWDSTK  =       .000  AFTSTK  =      .000
BREF  =       .6000 IN.      ZMRP  =      .0000 IN.                                       ATHRNG  =      1.000  ATHS    =      .000
SCALE =       .0056                                                                       CONFIG  =      3.000  SHDSTK  =      .000
                                                                                          ELT     =      1.000  SEPRKT  =     1.000

                              RUN NO.    23/ 0    RN/L =    6.30    GRADIENT INTERVAL =  -5.00/  5.00

  MACH       ALPHA       CNM        CLMM        CYM        CYNM        CBL        CA          CAB        XCP/L       CPB1       CPB2
  3.479     169.760     .87540     -.20550     -.16200     -.15460     -.04210   -2.45830     .00000     .58570     .00000     .00000
  3.479     167.830    1.21320     -.17450     -.21060     -.13180     -.05000   -2.49720     .00000     .57630     .00000     .00000
  3.479     163.720    2.06300      .05340     -.28220     -.24700     -.07550   -2.57120     .00000     .56440     .00000     .00000
  3.479     159.560    3.08960      .31360     -.40380     -.32500     -.11790   -2.69300     .00000     .55830     .00000     .00000
  3.479     155.410    4.23210      .62060     -.51510     -.40840     -.16090   -2.84120     .00000     .55460     .00000     .00000
  3.479     151.240    5.48020      .81960     -.64730     -.39410     -.21100   -2.89370     .00000     .55430     .00000     .00000
  3.479     149.220    6.19150      .48980     -.67430     -.40620     -.23400   -2.44750     .00000     .56010     .00000     .00000
  3.479     159.570    3.06310      .33240     -.40390     -.31480     -.12340   -2.70080     .00000     .55770     .00000     .00000
            GRADIENT   -.25854     -.04627      .02519      .01373      .00956     .01116     .00000     .00131     .00000     .00000

                                    MSFC 590(SA26F) 142-IN. SRB(139) NBRE1S1 ELT                    (R95D26)    ( 11 DEC 73  )

              REFERENCE DATA                                                                          PARAMETRIC DATA

SREF  =       .5030 SQ. IN   XMRP  =     5.5570 IN.                                       BETA    =       .000  PHI     =   135.000
LREF  =       .6000 IN.      YMRP  =      .0000 IN.                                       FWDSTK  =       .000  AFTSTK  =      .000
BREF  =       .6000 IN.      ZMRP  =      .0000 IN.                                       ATHRNG  =      1.000  ATHS    =      .000
SCALE =       .0056                                                                       CONFIG  =      3.000  SHDSTK  =      .000
                                                                                          ELT     =      1.000  SEPRKT  =     1.000

                              RUN NO.    39/ 0    RN/L =    4.90    GRADIENT INTERVAL =  -5.00/  5.00

  MACH       ALPHA       CNM        CLMM        CYM        CYNM        CBL        CA          CAB        XCP/L       CPB1       CPB2
   .595     169.600     .74430    -1.09890      .05570      .59260     -.10610   -1.45700     .00000     .69690     .00000     .00000
   .595     167.860     .99080    -1.38500      .04520      .73030     -.11820   -1.56610     .00000     .68050     .00000     .00000
   .595     163.790    1.53980    -1.99530      .13490      .86080     -.18530   -1.69950     .00000     .66890     .00000     .00000
   .595     159.730    2.19630    -2.22800      .17040      .66570     -.23040   -1.86760     .00000     .64930     .00000     .00000
   .595     155.690    2.76600    -2.23460      .11940     -.00110     -.27380   -2.06480     .00000     .63390     .00000     .00000
   .595     151.610    3.47910    -2.39250     -.29340      .11720     -.37580   -2.25990     .00000     .62260     .00000     .00000
   .595     149.650    3.94550    -2.92810     -.53890     1.02740     -.39870   -2.30950     .00000     .62710     .00000     .00000
   .595     159.740    2.16210    -2.19040      .16980      .68030     -.23120   -1.85890     .00000     .64920     .00000     .00000
            GRADIENT   -.15558      .07519      .02394      .01156      .01468     .04269     .00000     .00331     .00000     .00000
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DATE 06 NOV 74                    TABULATED SOURCE DATA,  MSFC TWT 590/595

                                    MSFC 590(SA26F) 142-IN. SRB(139) NBREIS1 ELT                    (R95026)    ( 11 DEC 73  )

                                                                                                      PARAMETRIC DATA
               REFERENCE DATA
                                                                                     BETA   =      .000   PHI     =   135.000
SREF  =      .5030 SQ. IN   XMRP  =     5.5570 IN.                                   FLOSTK =      .000   AFTSTK  =      .000
LREF  =      .8000 IN.      YMRP  =      .0000 IN.                                   ATHRNG =     1.000   ATHS    =      .000
BREF  =      .8000 IN.      ZMRP  =      .0000 IN.                                   CONFIG =     3.000   SHDSTK  =      .000
SCALE =      .0056                                                                   ELT    =     1.000   SEPRKT  =     1.000

                              RUN NO.   36/ 0    RN/L =   6.23    GRADIENT INTERVAL =  -5.00/  5.00

  MACH     ALPHA       CNM        CLMM       CYM        CYNM       CBL        CA         CAB       XCP/L      CPB1       CPB2
   .899    169.760     .90220     .12950     .03340     .94640    -.10070   -1.90990     .00000     .55490     .00000     .00000
   .899    167.600    1.16970    -.16150    -.04950    1.07100    -.11370   -2.00550     .00000     .57780     .00000     .00000
   .899    163.690    1.78530    -.67070     .03180    1.51530    -.15740   -2.09320     .00000     .59720     .00000     .00000
   .899    159.570    2.38850   -1.01270     .09640    1.20450    -.20000   -2.21740     .00000     .60110     .00000     .00000
   .899    155.430    3.17750   -1.60120     .03460     .55850    -.26800   -2.35730     .00000     .60760     .00000     .00000
   .899    151.220    4.26470   -2.30610    -.45140    -.17300    -.35340   -2.52830     .00000     .61060     .00000     .00000
   .899    149.200    4.98230   -2.55990    -.85370    -.20170    -.38310   -2.56620     .00000     .60810     .00000     .00000
   .899    159.560    2.45800   -1.02800     .10470    1.19490    -.19830   -2.25850     .00000     .60080     .00000     .00000
          GRADIENT    -.19170     .12817     .03264     .06933     .01399     .03179     .00000    -.00225     .00000     .00000

                              RUN NO.   37/ 0    RN/L =   6.87    GRADIENT INTERVAL =  -5.00/  5.00

  MACH     ALPHA       CNM        CLMM       CYM        CYNM       CBL        CA         CAB       XCP/L      CPB1       CPB2
  1.197    169.430    1.08320   -1.43000    -.04080     .93680    -.15030   -2.52220     .00000     .67420     .00000     .00000
  1.197    167.830    1.32720   -1.69610    -.07300    1.28390    -.15450   -2.59320     .00000     .67090     .00000     .00000
  1.197    163.470    2.33870   -2.25360     .05610    1.40620    -.22150   -2.69240     .00000     .65540     .00000     .00000
  1.197    159.210    3.17780   -2.77090     .70600    1.30790    -.29020   -2.73040     .00000     .53770     .00000     .00000
  1.197    154.880    4.82170   -3.02250     .37460    -.57490    -.36180   -2.84110     .00000     .61770     .00000     .00000
  1.197    150.530    6.34950   -2.27830     .20900   -1.20570    -.42370   -2.95090     .00000     .59770     .00000     .00000
  1.197    148.490    7.57540   -2.41940     .49010     .38290    -.45450   -3.01390     .00000     .592[illegible]     .00000     .00000
  1.197    159.210    3.21030   -2.78430     .70680    1.49200    -.29580   -2.73070     .00000     .63730     .00000     .00000
          GRADIENT    -.31550     .04552    -.02497     .09403     .01559     .02197     .00000     .00419     .00000     .00000

                              RUN NO.   48/ 0    RN/L =   7.20    GRADIENT INTERVAL =  -5.00/  5.00

  MACH     ALPHA       CNM        CLMM       CYM        CYNM       CBL        CA         CAB       XCP/L      CPB1       CPB2
  1.980    169.530     .93780    -.96080     .06220     .45540    -.08550   -2.32450     .00000     .65010     .00000     .00000
  1.980    167.640    1.28250   -1.11190     .14550     .74320    -.11320   -2.55110     .00000     .63720     .00000     .00000
  1.980    148.510    7.43490     .44760     .47210     .78340    -.33750   -2.85550     .00000     .56160     .00000     .00000
  1.980    159.150    3.62370    -.99260     .26930    1.07730    -.20590   -2.69700     .00000     .59890     .00000     .00000
  1.980    163.400    2.33090   -1.32170     .24470     .97800    -.15920   -2.63350     .00000     .61280     .00000     .00000
  1.980    159.140    3.62820   -1.08770     .29070    1.01200    -.19740   -2.72280     .00000     .59100     .00000     .00000
  1.980    154.830    5.09440    -.76340     .34180     .67910    -.25950   -2.79710     .00000     .57590     .00000     .00000
  1.980    150.560    6.57650    -.06920     .45110     .73200    -.30780   -2.83150     .00000     .56740     .00000     .00000
          GRADIENT    -.30991    -.06468    -.01813    -.00428     .01172     .01624     .00000     .00413     .00000     .00000
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MSFC 590(SA26F) 142-IN. SRB(139) NBRE151 ELT (R95026) (11 DEC 73)

REFERENCE DATA

SREF = .5030 SQ. IN XMRP = 5.5570 IN.
LREF = .8000 IN. YMRP = .0000 IN.
BREF = .8000 IN. ZMRP = .0000 IN.
SCALE = .0036

PARAMETRIC DATA

BETA = .000 PHI = 135.000
FWDSTK = .000 AFTSTK = .000
ATHRNG = 1.000 ATHS = .000
CONFIG = 3.000 SHDSTK = .000
ELT = 1.000 SEPRKT = 1.000

RUN NO. 24/ 0 RN/L = 6.31 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CPB1	CPB2
3.479	169.770	.78550	-.23840	.00670	.13040	-.04140	-2.47380	.00000	.59110	.00000	.00000
3.479	167.850	1.11540	-.14330	.00260	.21180	-.05310	-2.52030	.00000	.57700	.00000	.00000
3.479	163.740	1.60010	.07730	.07230	.33710	-.08330	-2.60260	.00000	.56320	.00000	.00000
3.479	159.590	2.07090	.32250	.13350	.25460	-.13710	-2.72740	.00000	.55740	.00000	.00000
3.479	155.450	3.97510	.65750	.20030	.21840	-.17670	-2.86860	.00000	.55300	.00000	.00000
3.479	151.260	5.19630	.79120	.29750	.31430	-.23940	-2.93320	.00000	.55410	.00000	.00000
3.479	149.260	5.68060	.30700	.34130	.33320	-.25610	-2.46780	.00000	.56230	.00000	.00000
3.479	159.600	2.86190	.32190	.12620	.25430	-.13190	-2.73320	.00000	.55740	.00000	.00000
	GRADIENT	-.24794	-.04107	-.01678	-.00637	.01082	.01177	.00000	.00138	.00000	.00000

MSFC 590(SA26F) 142-IN. SRB(139) NBRE152 ELT (R95027) (11 DEC 73)

REFERENCE DATA

SREF = .5030 SQ. IN XMRP = 5.5570 IN.
LREF = .8000 IN. YMRP = .0000 IN.
BREF = .8000 IN. ZMRP = .0000 IN.
SCALE = .0036

PARAMETRIC DATA

BETA = .000 PHI = 45.000
FWDSTK = .000 AFTSTK = .000
ATHRNG = 1.000 ATHS = .000
CONFIG = 4.000 SHDSTK = .000
ELT = 1.000 SEPRKT = 2.000

RUN NO. 79/ 0 RN/L = 4.94 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CPB1	CPB2
.597	80.000	12.51250	10.39250	.03550	.05190	-.01680	.21940	.00000	.49880	.00000	.00000
.597	81.690	12.54770	9.87270	-.28970	1.71800	-.03370	.27760	.00000	.50240	.00000	.00000
.597	85.640	12.77600	8.31740	-.18570	1.69760	-.04560	.31740	.00000	.51340	.00000	.00000
.597	89.610	12.98790	6.17570	-.08480	1.19870	-.01630	.44140	.00000	.52770	.00000	.00000
.597	93.760	13.04860	4.55380	-.07420	.07800	-.01530	.51370	.00000	.53810	.00000	.00000
.597	97.750	12.82380	2.89450	.10730	.42010	-.01460	.41520	.00000	.54810	.00000	.00000
.597	99.650	12.88790	2.68300	.08040	.50990	.00460	.32300	.00000	.54950	.00000	.00000
.597	89.610	12.95850	6.06400	-.09880	1.39780	-.00500	.44490	.00000	.52840	.00000	.00000
	GRADIENT	.01984	-.41696	.01153	-.03490	.00138	.00823	.00000	.00274	.00000	.00000

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                     MSFC 590(SA26F) 142-IN. SRB(130) NBRE182 ELT                    (R95027)   ( 11 DEC 73  )

          REFERENCE DATA                                                         PARAMETRIC DATA

SREF  =      .5030 SQ. IN   XMRP  =     5.5570 IN.                   BETA    =      .000   PHI     =    45.000
LREF  =      .8000 IN.      YMRP  =      .0000 IN.                   FWDSTK  =      .000   AFTSTK  =      .000
BREF  =      .8000 IN.      ZMRP  =      .0000 IN.                   ATHRNG  =     1.000   ATHS    =      .000
SCALE =      .0058                                                   CONFIG  =     4.000   SHDSTK  =      .000
                                                                     ELT     =     1.000   SEPRKT  =     2.000

                    RUN NO.   80/ 0   RN/L =   6.28   GRADIENT INTERVAL =  -5.00/  5.00

  MACH     ALPHA      CNM        CLMM       CYM       CYNM       CBL        CA        CAB       XCP/L      CPB1      CPB2
   .904    80.170   15.73210   12.84610    .17280    .10420    .01120    .47570    .00000    .49990    .00000    .00000
   .904    82.030   15.82750   11.69040    .16520    .12160    .01090    .50060    .00000    .50630    .00000    .00000
   .904    85.920   16.14470    8.59110    .15590    .17050    .00330    .54030    .00000    .52310    .00000    .00000
   .904    89.840   16.44660    6.31240    .15710    .12760    .01610    .55750    .00000    .53520    .00000    .00000
   .904    93.760   16.24850    4.50780    .17670    .06640    .01080    .47680    .00000    .54390    .00000    .00000
   .904    97.710   16.32660    2.47350    .16000   -.10230    .01500    .33970    .00000    .55420    .00000    .00000
   .904    99.580   16.17020    1.48910    .11200    .04750    .00070    .24360    .00000    .55900    .00000    .00000
   .904    89.850   16.52580    6.38930    .13850    .21210    .01280    .55260    .00000    .53500    .00000    .00000
         GRADIENT     .02301    -.58018   -.00161   -.00795   -.00012   -.01103    .00000    .00301    .00000    .00000

                    RUN NO.   81/ 0   RN/L =   6.65   GRADIENT INTERVAL =  -5.00/  5.00

  MACH     ALPHA      CNM        CLMM       CYM       CYNM       CBL        CA        CAB       XCP/L      CPB1      CPB2
  1.198    80.160   18.92810   11.45500    .15170   -.11490   -.00440    .51000    .00000    .51720    .00000    .00000
  1.198    82.050   19.03970   11.27390    .14730   -.11080   -.00300    .51080    .00000    .51820    .00000    .00000
  1.198    86.020   19.31670   10.61520    .12930    .08460   -.01060    .44750    .00000    .52170    .00000    .00000
  1.198    89.970   19.34020    9.34140    .12690    .14940   -.01680    .34370    .00000    .52710    .00000    .00000
  1.198    93.920   19.57030    8.28120    .07130    .26060   -.00140    .20120    .00000    .53200    .00000    .00000
  1.198    97.870   19.28370    7.07550    .06010    .30100   -.00200    .03100    .00000    .53660    .00000    .00000
  1.198    99.760   19.00300    6.62300    .02580    .32570    .00480   -.04610    .00000    .53810    .00000    .00000
  1.198    89.950   19.26090    8.92870    .11650    .19710   -.00420    .35710    .00000    .52870    .00000    .00000
         GRADIENT     .01054    -.25765   -.00618    .02374    .00039   -.02932    .00000    .00112    .00000    .00000

                    RUN NO.   54/ 0   RN/L =   7.07   GRADIENT INTERVAL =  -5.00/  5.00

  MACH     ALPHA      CNM        CLMM       CYM       CYNM       CBL        CA        CAB       XCP/L      CPB1      CPB2
  1.964    80.130   19.43450   10.11430   -.00480    .04010   -.03590    .61900    .00000    .52410    .00000    .00000
  1.964    82.020   19.59140    9.85720   -.01530    .04280   -.03960    .56250    .00000    .52550    .00000    .00000
  1.964    85.990   19.74270    9.38120   -.01750    .08900   -.03390    .44590    .00000    .52780    .00000    .00000
  1.964    89.960   19.72780    8.74130   -.01830    .07780   -.03290    .32770    .00000    .53040    .00000    .00000
  1.964    93.930   19.54240    7.94110   -.00570    .05350   -.03150    .18780    .00000    .53340    .00000    .00000
  1.964    97.890   19.39520    6.97410   -.04210    .12410   -.03550    .06630    .00000    .53720    .00000    .00000
  1.964    99.770   19.11320    6.51980   -.03890    .13410   -.03240   -.00480    .00000    .53970    .00000    .00000
  1.964    89.960   19.70380    8.70610   -.02110    .06550   -.03670    .32680    .00000    .53050    .00000    .00000
         GRADIENT    -.01593    -.18237   -.00199    .00407    .00022   -.03165    .00000    .00974    .00000    .00000
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MSFC 590(SA26F) 142-IN. SRB(139) NBRE1S2 ELT (R95027) (11 DEC 73)

REFERENCE DATA

SREF = .5030 SQ. IN XMRP = 5.5570 IN.
LREF = .8000 IN. YMRP = .0000 IN.
BREF = .8000 IN. ZMRP = .0000 IN.
SCALE = .0056

PARAMETRIC DATA

BETA = .000 PHI = 45.000
FWDSTK = .000 AFTSTK = .000
ATHRNG = 1.000 ATMS = .000
CONFIG = 4.000 SHDSTK = .000
ELT = 1.000 SEPRKT = 2.000

RUN NO. 108/ 0 RN/L = 7.16 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMN	CYM	CYNM	CBL	CA	CAB	XCP/L	CPB1	CPB2
3.479	80.040	18.63910	10.04490	.04280	.06850	-.04970	.67990	.00000	.52260	.00000	.00000
3.479	81.930	18.82470	9.88220	.04470	.08320	-.03370	.61340	.00000	.52370	.00000	.00000
3.479	85.920	19.06830	9.38470	.04330	.06240	-.04270	.46110	.00000	.52640	.00000	.00000
3.479	89.890	19.19430	8.64930	.04150	.05100	-.04610	.30250	.00000	.52980	.00000	.00000
3.479	93.850	19.12650	8.01340	.03830	.06620	-.03820	.13220	.00000	.53240	.00000	.00000
3.479	97.850	18.8[illegible]570	7.36350	.02900	.04150	-.03330	-.04330	.00000	.53470	.00000	.00000
3.479	99.750	18.65630	7.02480	.02800	.04490	-.03710	-.12100	.00000	.53580	.00000	.00000
3.479	89.890	19.16760	8.65350	.04910	.08200	-.03520	.30640	.00000	.52970	.00000	.00000
	GRADIENT	.00160	-.15678	-.00082	-.00156	.00041	-.04093	.00000	.00069	.00000	.00000

MSFC 590(SA26F) 142-IN. SRB(139) NBRE1S2 ELT (R95028) (11 DEC 73)

REFERENCE DATA

SREF = .5030 SQ. IN XMRP = 5.5570 IN.
LREF = .8000 IN. YMRP = .0000 IN.
BREF = .8000 IN. ZMRP = .0000 IN.
SCALE = .0056

PARAMETRIC DATA

BETA = .000 PHI = 90.000
FWDSTK = .000 AFTSTK = .000
ATHRNG = 1.000 ATMS = .000
CONFIG = 4.000 SHDSTK = .000
ELT = 1.000 SEPRKT = 2.000

RUN NO. 84/ 0 RN/L = 4.95 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMN	CYM	CYNM	CBL	CA	CAB	XCP/L	CPB1	CPB2
.598	80.080	14.54030	14.03770	-3.49760	1.69380	-.31720	.12230	.00000	.48780	.00000	.00000
.598	81.930	14.60740	12.35110	-3.48920	1.49460	-.33020	.25190	.00000	.49760	.00000	.00000
.598	85.870	14.60260	9.34210	-3.69270	.80260	-.35060	.36790	.00000	.51430	.00000	.00000
.598	89.810	14.82700	6.34390	-3.63670	1.09390	-.36040	.43220	.00000	.53160	.00000	.00000
.598	93.750	14.91350	4.31180	-3.48110	.94860	-.35950	.46290	.00000	.54290	.00000	.00000
.598	97.730	14.98240	2.50200	-3.61950	.99370	-.37480	.32790	.00000	.55290	.00000	.00000
.593	99.620	14.84600	1.65380	-3.66740	1.02890	-.37770	.21390	.00000	.55740	.00000	.00000
.598	89.810	14.75730	6.40520	-3.66980	1.02110	-.34690	.42940	.00000	.53110	.00000	.00000
	GRADIENT	.02067	-.62992	-.00534	-.02842	-.00282	.00536	.00000	.00354	.00000	.00000

MSFC 590(SA26F) 142-IN. SRB(139) NBRE1S2 ELT (R95028) (11 DEC 73)

REFERENCE DATA

SREF = .3030 SQ. IN XMRP = 5.5570 IN.
LREF = .8000 IN. YMRP = .0000 IN.
BREF = .8000 IN. ZMRP = .0000 IN.
SCALE = .0036

PARAMETRIC DATA

BETA = .000 PHI = 90.000
FWDSTK = .000 AFTSTK = .000
ATHRNG = 1.000 ATHS = .000
CONFIG = 4.000 SHDSTK = .000
ELT = 1.000 SEPRKT = 2.000

RUN NO. 83/ 0 RN/L = 6.25 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CPB1	CPB2
.901	80.210	17.20810	14.29970	-2.58880	-.14220	-.41400	.45000	.00000	.49870	.00000	.00000
.901	82.070	17.37600	13.23080	-2.59710	-.12310	-.41710	.45410	.00000	.50440	.00000	.00000
.901	85.980	17.56260	10.57610	-2.59930	-.14280	-.43020	.45370	.00000	.51740	.00000	.00000
.901	89.890	17.85020	7.93990	-2.59120	-.12730	-.43510	.46840	.00000	.53020	.00000	.00000
.901	93.800	17.81740	5.79570	-2.55930	-.12680	-.43280	.40660	.00000	.54000	.00000	.00000
.901	97.720	17.66440	2.98550	-2.61570	-.10070	-.43630	.28950	.00000	.55270	.00000	.00000
.901	99.580	17.56620	1.75450	-2.60750	.27780	-.43910	.22360	.00080	.55940	.00005	.00000
.901	89.890	17.83980	7.88890	-2.59230	-.10630	-.42590	.46420	.00000	.53050	.00000	.00000
	GRADIENT	.01972	-.64690	-.00050	.01264	-.00118	-.01076	.00000	.08307	.00000	.00000

RUN NO. 82/ 0 RN/L = 6.65 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CPB1	CPB2
1.198	80.200	20.78480	12.65150	-2.36140	-.46450	-.50770	.57670	.00000	.51690	.00000	.00000
1.198	82.030	20.94920	12.39230	-2.39680	-.49920	-.51610	.55970	.00000	.51830	.00000	.00000
1.198	86.030	21.18930	11.20910	-2.42840	-.48400	-.51880	.50820	.00000	.52340	.00000	.00000
1.198	89.980	21.23700	10.01970	-2.45950	-.45320	-.53680	.39660	.00000	.52800	.00000	.00000
1.198	93.900	21.36220	8.62630	-2.43620	-.44300	-.52700	.22700	.00000	.53360	.00000	.00000
1.198	97.870	21.29750	7.26600	-2.46880	-.36830	-.52850	.03180	.00000	.53970	.00000	.00000
1.198	99.730	20.98350	6.42920	-2.45250	-.29330	-.50350	-.05590	.00000	.54150	.00000	.00000
1.199	89.970	21.24710	9.68760	-2.45510	-.40700	-.53030	.38900	.00000	.52930	.00000	.00000
	GRADIENT	.01551	-.32162	-.00430	.00828	-.00026	-.03306	.00000	.00127	.00000	.00000

RUN NO. 55/ 0 RN/L = 7.08 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CPB1	CPB2
1.932	80.130	21.05460	10.38450	-1.83880	-.31710	-.51580	.67220	.00000	.52630	.00000	.00000
1.932	82.020	21.24400	10.20180	-1.85860	-.31240	-.53040	.61690	.00000	.52740	.00000	.00000
1.932	85.990	21.39920	9.59890	-1.89950	-.34210	-.53330	.50070	.00000	.52990	.00000	.00000
1.932	89.870	21.41930	9.10830	-1.91180	-.42760	-.52080	.38180	.00000	.53190	.00000	.00000
1.932	93.940	21.26730	8.57450	-1.88700	-.58560	-.51360	.23530	.00000	.53360	.00000	.00000
1.932	97.900	21.09550	7.72070	-1.88560	-.86580	-.51380	.09970	.00000	.53670	.00000	.00000
1.932	99.790	20.81460	7.31620	-1.86040	-.76850	-.51120	.02390	.00000	.53790	.00000	.00000
1.932	89.960	21.33400	9.04330	-1.90430	-.45670	-.52010	.37800	.00000	.53206	.00000	.00000
	GRADIENT	-.01157	-.15365	-.00108	-.02317	.00072	-.03287	.00000	.00058	.00000	.00000

MSFC 590(SA26F) 142-IN. SRB(139) NBRE152 ELT (R95028) (11 DEC 73)

REFERENCE DATA

SREF = .5030 SQ. IN XMRP = 5.5570 IN.
LREF = .6000 IN. YMRP = .0000 IN.
BREF = .6000 IN. ZMRP = .0000 IN.
SCALE = .0056

PARAMETRIC DATA

BETA = .000 PHI = 90.000
FWDSTK = .000 AFTSTK = .000
ATMRNG = 1.000 ATMS = .000
CONFIG = 4.000 SMDSTK = .000
ELT = 1.000 SEPRKT = 2.000

RUN NO. 105/ 0 RN/L = 7.16 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CPB1	CPB2
3.479	80.040	19.51930	10.22410	-.83590	-.25690	-.37500	.70290	.00000	.52380	.00000	.00000
3.479	81.930	19.70440	10.04070	-.81530	-.26070	-.36990	.63230	.00000	.52580	.00000	.00000
3.479	85.920	19.94720	9.54000	-.82370	-.25870	-.36040	.48350	.00000	.52750	.00000	.00000
3.479	89.890	20.09130	8.84350	-.82490	-.24350	-.36130	.31370	.00000	.53060	.00000	.00000
3.479	93.860	19.97850	8.27360	-.80420	-.30280	-.35790	.14160	.00000	.53280	.00000	.00000
3.479	97.680	19.73330	7.74760	-.78820	-.36430	-.36390	-.03810	.00000	.53450	.00000	.00000
3.479	99.750	19.53580	7.48560	-.78910	-.36130	-.35340	-.12090	.00000	.53550	.00000	.00000
3.479	89.890	20.07270	8.81080	-.82840	-.26190	-.36710	.31400	.00000	.53070	.00000	.00000
	GRADIENT	.00148	-.14425	.00130	-.00330	.00077	-.04201	.00000	.00080	.00000	.00000

MSFC 590(SA26F) 142-IN. SRB(139) NBRE152 ELT (R95029) (11 DEC 73)

REFERENCE DATA

SREF = .5030 SQ. IN XMRP = 5.5570 IN.
LREF = .6000 IN. YMRP = .0000 IN.
BREF = .6000 IN. ZMRP = .0000 IN.
SCALE = .0056

PARAMETRIC DATA

BETA = .000 PHI = 135.000
FWDSTK = .000 AFTSTK = .000
ATMRNG = 1.000 ATMS = .000
CONFIG = 4.000 SMDSTK = .000
ELT = 1.000 SEPRKT = 2.000

RUN NO. 97/ 0 RN/L = 5.00 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CPB1	CPB2
.599	79.980	12.12200	9.36960	1.54320	4.97040	-.73100	.40590	.00000	.50350	.00000	.00000
.599	81.850	12.15450	8.75510	1.58790	4.45430	-.73250	.41670	.00000	.50780	.00000	.00000
.599	85.820	12.38090	7.54560	1.77630	3.78480	-.73710	.40550	.00000	.51680	.00000	.00000
.599	89.800	12.41850	5.25600	1.96570	2.29140	-.74210	.52410	.00000	.53200	.00000	.00000
.599	93.750	12.43620	3.60980	2.14340	1.53180	-.73810	.54560	.00000	.54290	.00000	.00000
.599	97.740	12.27170	2.18580	2.44190	.54250	-.74240	.36730	.00000	.55206	.00000	.00000
.599	99.610	12.20480	1.55890	2.20100	-.95920	-.75070	.21240	.00000	.55610	.00002	.00000
.599	89.780	12.44620	5.32490	1.97540	2.18230	-.73060	.52540	.00000	.53160	.00000	.00000
	GRADIENT	.00559	-.41233	.04195	-.28033	-.00079	-.00496	.00000	.00277	.00000	.00000

MSFC 590(SA26F) 142-IN. SRB(130) NORE182 ELT (R93D20) (11 DEC 73)

REFERENCE DATA

SREF = .5030 SQ. IN XMRP = 5.5570 IN.
LREF = .8000 IN. YMRP = .0000 IN.
BREF = .8000 IN. ZMRP = .0000 IN.
SCALE = .0056

PARAMETRIC DATA

BETA = .000 PHI = 135.000
FWDSTK = .000 AFTSTK = .000
ATHRNG = 1.000 ATMS = .000
CONFIG = 4.000 SHDSTK = .000
ELT = 1.000 SEPRKT = 2.000

RUN NO. 98/ 0 RN/L = 6.30 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CPB1	CPB2
.899	80.180	15.21170	12.99020	2.90870	1.94420	-.70660	.44770	.00000	.49690	.00000	.00000
.899	82.050	15.31720	12.06240	2.91940	1.84230	-.71080	.46680	.00000	.50230	.00000	.00000
.899	85.930	15.58080	9.40670	2.90730	1.70090	-.73110	.49570	.00000	.51730	.00000	.00000
.899	89.870	15.87480	6.88980	3.00640	1.36420	-.73830	.51190	.00000	.53110	.00000	.00000
.899	93.770	15.83030	4.59970	3.15780	1.05800	-.74120	.45120	.00000	.54280	.00000	.00000
.899	97.710	15.70200	2.28870	3.25080	.65300	-.73350	.30900	.00000	.55470	.00000	.00000
.899	99.560	15.52840	1.31960	3.20630	.57720	-.73330	.18230	.00000	.55960	.00000	.00000
.899	89.850	15.77320	6.86050	3.01220	1.35380	-.72650	.50560	.00000	.53110	.00000	.00000
	GRADIENT	.02067	-.61108	.01894	-.07353	-.00139	-.01169	.00000	.00329	.00000	.00000

RUN NO. 99/ 0 RN/L = 6.71 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CPB1	CPB2
1.197	80.170	18.96460	11.65770	2.33820	.91660	-.61230	.55610	.00000	.51640	.00000	.00000
1.197	82.050	19.14820	11.28550	2.32300	.94440	-.61460	.57960	.00000	.51850	.00000	.00000
1.197	86.020	19.43870	10.53580	2.37550	.94040	-.61320	.49400	.00000	.52230	.00000	.00000
1.197	89.980	19.60980	9.55800	2.33900	.96200	-.62610	.35860	.00000	.52680	.00000	.00000
1.197	93.910	19.59690	8.40900	2.29180	1.01730	-.60550	.18860	.00000	.53150	.00000	.00000
1.197	97.900	19.41310	7.60470	2.28270	1.02410	-.60410	.00430	.00000	.53460	.00000	.00000
1.197	99.770	19.26850	7.32070	2.25240	1.03350	-.60890	-.09650	.00000	.53550	.00000	.00000
1.197	89.970	19.57310	9.83860	2.31460	.98530	-.61300	.33020	.00000	.52550	.00000	.00000
	GRADIENT	.01635	-.22952	-.00427	.00596	.00042	-.03486	.00000	.00101	.00000	.00000

RUN NO. 60/ 0 RN/L = 7.03 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CPB1	CPB2
1.961	80.130	19.16200	10.09320	1.75060	.61570	-.56930	.61130	.00000	.52360	.00000	.00000
1.961	82.020	19.33430	9.86620	1.74990	.61750	-.56830	.55610	.00000	.52490	.00000	.00000
1.961	85.990	19.58650	9.31580	1.76270	.60790	-.57620	.43930	.00000	.52770	.00000	.00000
1.961	89.960	19.62880	8.56750	1.79800	.54660	-.57720	.31940	.00000	.53090	.00000	.00000
1.961	93.920	19.50410	7.70780	1.79300	.53980	-.57730	.17590	.00000	.53430	.00000	.00000
1.961	97.880	19.30140	6.85800	1.76560	.54020	-.57400	.02760	.00000	.53750	.00000	.00000
1.961	99.760	19.10800	6.39470	1.73910	.52170	-.57600	-.05090	.00000	.53920	.00000	.00000
1.961	89.970	19.58890	8.76150	1.79180	.55220	-.58400	.30200	.00000	.53000	.00000	.00000
	GRADIENT	-.00316	-.19012	.00038	-.00516	-.00033	-.03354	.00000	.00080	.00000	.00000

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                          MSFC 590(SA26F) 142-IN. SRB(139) NBRE1S2 ELT                 (R95029)   ( 11 DEC 73  )

          REFERENCE DATA                                                            PARAMETRIC DATA

SREF  =        .5030 SQ. IN   XMRP  =     5.5570 IN.                   BETA   =      .000  PHI     =   135.000
LREF  =        .8000 IN.      YMRP  =      .0000 IN.                   FWDSTK =      .000  AFTSTK  =      .000
BREF  =        .8000 IN.      ZMRP  =      .0000 IN.                   ATHRNG =     1.000  ATHS    =      .000
SCALE =        .0036                                                   CONFIG =     4.000  SMDSTK  =      .000
                                                                       ELT    =     1.000  SEPRKT  =     2.000

                       RUN NO.  100/ 0    RN/L =   7.11    GRADIENT INTERVAL =  -5.00/  5.00

 MACH     ALPHA      CNM       CLMM       CYM       CYNM       CBL        CA        CAB      XCP/L     CPB1      CPB2
 3.479    80.030  18.76240  10.40580   1.62280    .42590   -.54930    .60220    .00000    .52130    .00000    .00000
 3.479    81.940  18.91960  10.16380   1.64300    .43650   -.55950    .61240    .00000    .52270    .00000    .00000
 3.479    85.920  19.20640   9.60960   1.66600    .46300   -.56160    .46140    .00000    .52570    .00000    .00000
 3.479    89.900  19.27150   8.81050   1.66280    .45040   -.57150    .29980    .00000    .52920    .00000    .00000
 3.479    93.830  19.21090   7.85340   1.67520    .47920   -.56910    .11610    .00000    .53320    .00000    .00000
 3.479    97.940  18.93790   7.00760   1.64840    .49050   -.55910   -.07670    .00000    .53630    .00000    .00000
 3.479    99.710  18.74020   6.63460   1.62460    .45340   -.56360   -.16590    .00000    .53770    .00000    .00000
 3.479    89.880  19.26260   8.81530   1.66650    .45790   -.56670    .30110    .00000    .52920    .00000    .00000
        GRADIENT   -.00005   -.19687    .00028    .00195   -.00048   -.04322    .00000    .00085    .00000    .00000

                          MSFC 590(SA26F) 142-IN. SRB(139) NBRE1A                      (R95030)   ( 11 DEC 73  )

          REFERENCE DATA                                                            PARAMETRIC DATA

SREF  =        .5030 SQ. IN   XMRP  =     5.5570 IN.                   BETA   =      .000  PHI     =      .000
LREF  =        .8000 IN.      YMRP  =      .0000 IN.                   FWDSTK =      .000  AFTSTK  =      .000
BREF  =        .8000 IN.      ZMRP  =      .0000 IN.                   ATHRNG =     1.000  ATHS    =      .000
SCALE =        .0036                                                   CONFIG =     1.000  SMDSTK  =      .000
                                                                       ELT    =      .000  SEPRKT  =      .000

                       RUN NO.  108/ 0    RN/L =   7.13    GRADIENT INTERVAL =  -5.00/  5.00

 MACH     ALPHA      CNM       CLMM       CYM       CYNM       CBL        CA        CAB      XCP/L     CPB1      CPB2
 3.480   156.810   3.37730    .73560   -.14710   -.07430    .00890  -2.92550    .00000    .54880    .00000    .00000
 3.480   156.190   3.49160    .76160   -.15160   -.07470    .01650  -2.95580    .00000    .54870    .00000    .00000
 3.480   155.670   3.62530    .76810   -.16230   -.06000    .00190  -2.99440    .00000    .54920    .00000    .00000
 3.480   155.160   3.75930    .77420   -.15760   -.05990    .01105  -3.02840    .00000    .54970    .00000    .00000
 3.480   154.640   3.90840    .84370   -.16590   -.07140    .00770  -3.06240    .00000    .54890    .00000    .00000
 3.480   154.120   4.02600    .85160   -.16280   -.09210    .00930  -3.09920    .00000    .54910    .00000    .00000
 3.480   153.600   4.19550    .87630   -.16420   -.08220   -.00070  -3.15330    .00000    .54950    .00000    .00000
 3.480   153.080   4.34710    .87220   -.17630   -.09330    .00570  -3.20660    .00000    .55020    .00000    .00000
 3.480   152.560   4.48990    .88870   -.17340   -.10370    .01100  -3.24400    .00000    .55040    .00000    .00000
 3.480   152.040   4.63280    .90360   -.17440   -.10920    .00230  -3.30680    .00000    .55060    .00000    .00000
 3.480   151.530   4.78420    .94060   -.17920   -.10980    .00270  -3.36570    .00000    .55050    .00000    .00000
 3.490   154.100   4.01690    .85910   -.17020   -.08740    .00010  -3.10310    .00000    .54910    .00000    .00000
        GRADIENT   -.27692   -.03[illegible]    .00577    .00932    .00124    .08496    .00000   -.00038    .00000    .00000
```

MSFC 590(SA26F) 142-IN. SRB(139) NBRE1A (R95031) (11 DEC 73)

REFERENCE DATA

SREF = .5030 SQ. IN XMRP = 5.5570 IN.
LREF = .8000 IN. YMRP = .0000 IN.
BREF = .8000 IN. ZMRP = .0000 IN.
SCALE = .0056

PARAMETRIC DATA

BETA = .000 PHI = .000
FWDSTK = .000 AFTSTK = .000
ATHRNG = 1.000 ATHS = .000
CONFIG = 1.000 SHDSTK = .000
ELT = .000 SEPRKT = .000

RUN NO. 109/ 0 RN/L = 7.16 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMM	CYM	CYNN	CBL	CA	CAB	XCP/L	CFB1	CFB2
3.479	150.990	4.95380	.97060	-.18120	-.07390	.01370	-3.40510	.00000	.55050	.00000	.00000
3.479	150.480	5.08670	1.07840	-.17440	-.10020	.02010	-3.45920	.00000	.54920	.00000	.00000
3.479	149.980	5.22820	1.17840	-.18290	-.10140	.01600	-3.50580	.00000	.54810	.00000	.00000
3.479	149.460	5.37030	1.24690	-.17640	-.11210	.00700	-3.53840	.00000	.54760	.00000	.00000
3.479	148.950	5.51160	1.30770	-.18840	-.12880	.02300	-3.55120	.00000	.54720	.00000	.00000
3.479	148.330	5.79580	.21220	-.20610	-.00540	.00210	-2.86770	.00000	.56350	.00000	.00000
3.479	147.810	5.94860	.24230	-.21450	-.01670	-.00120	-2.87810	.00000	.56320	.00000	.00000
3.479	147.290	6.12670	.23270	-.21980	-.00170	-.00230	-2.89140	.00000	.56340	.00000	.00000
3.479	146.770	6.27770	.25130	-.22030	-.03320	.00020	-2.90190	.00000	.56330	.00000	.00000
3.479	146.250	6.42610	.29095	-.22170	-.01810	-.00130	-2.92530	.00000	.56290	.00000	.00000
3.479	148.930	5.50260	1.31770	-.18840	-.12370	.01330	-3.54980	.00000	.54790	.00000	.00000
	GRADIENT	-.32204	.24645	.01159	-.02250	.00476	-.16493	.00000	-.00412	.00000	.00000

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                              MSFC 590(SA26F) 142-IN. SRB(139) NBRE1A                       (R95032)   ( 11 DEC 73  )

              REFERENCE DATA                                                                     PARAMETRIC DATA

SREF  =      .5030 SQ. IN   XMRP  =     5.5570 IN.                                BETA   =     .000   PHI     =      .000
LREF  =      .8000 IN.      YMRP  =      .0000 IN.                                FWDSTK =     .000   AFTSTK  =      .000
BREF  =      .8000 IN.      ZMRP  =      .0000 IN.                                ATMRNG =    1.000   ATMS    =      .000
SCALE =      .0036                                                                CONFIG =    1.000   SHDSTK  =      .000
                                                                                  ELT    =     .000   SEPRKT  =      .000

                        RUN NO.  110/ 0    RN/L =   7.11    GRADIENT INTERVAL =  -5.00/  5.00

  MACH     ALPHA      CNM        CLMM       CYM       CYNM       CBL        CA        CAB       XCP/L      CPB1      CPB2
  3.480   145.700   6.82450     .31300   -.21550   -.03370    .01350  -2.93140    .00000    .56270    .00000    .00000
  3.480   145.180   6.78160     .34230   -.21630   -.04980    .01010  -2.94850    .00000    .56240    .00000    .00000
  3.480   144.130   7.13090     .41340   -.22260   -.05620    .01540  -3.00060    .00000    .56180    .00000    .00000
  3.480   143.110   7.40670     .45040   -.22930   -.00540    .00200  -3.04470    .00000    .56160    .00000    .00000
  3.480   142.070   7.72590     .56060   -.23070   -.06360    .02060  -3.08550    .00000    .56060    .00000    .00000
  3.480   141.030   8.01890     .63910   -.23310   -.05430    .00570  -3.12760    .00000    .56000    .00000    .00000
  3.480   140.000   8.31070     .83080   -.23510   -.07680    .00740  -3.17930    .00000    .55840    .00000    .00000
  3.480   138.970   8.50730    1.04660   -.24160   -.05290    .00050  -3.20500    .00000    .55660    .00000    .00000
  3.480   137.930   8.90220    1.22310   -.23970   -.08550    .00710  -3.17800    .00000    .55530    .00000    .00000
  3.480   136.910   9.14830    1.51930   -.23830   -.07730   -.00360  -3.18980    .00000    .55300    .00000    .00000
  3.480   135.960   9.42190    1.66480   -.24390   -.09450    .00670  -3.14750    .00000    .55210    .00000    .00000
  3.480   141.050   8.01000     .62860   -.23700   -.03900   -.00450  -3.12900    .00000    .56010    .00000    .00000
          GRADIENT  -.28660    -.13928    .00279    .00552    .00117    .02692    .00000    .00111    .00000    .00000
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MSFC 590(SA26F) 142-IN. SRB(138) NBRE1A (R95033) (11 DEC 73)

REFERENCE DATA

SREF = .5030 SQ. IN XMRP = 5.5570 IN.
LREF = .8000 IN. YMRP = .0000 IN.
BREF = .8000 IN. ZMRP = .0000 IN.
SCALE = .0056

PARAMETRIC DATA

BETA = .000 PHI = .000
FWDSTK = .000 AFTSTK = .000
ATHRNG = 1.000 ATHS = .000
CONFIG = 1.000 SHDSTK = .000
ELT = .000 SEPRKT = .000

RUN NO. 111/ 0 RN/L = 6.07 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CPB1	CPB2
4.450	156.840	3.03970	1.19730	-.13470	-.09320	.01820	-2.83530	.00000	.53440	.00000	.00000
4.450	154.890	3.36840	1.21820	-.15740	-.08830	.00370	-3.02510	.00000	.53870	.00000	.00000
4.450	152.850	4.10480	1.31100	-.17440	-.06210	.00270	-3.19400	.00000	.54050	.00000	.00000
4.450	150.600	4.67700	1.52600	-.17770	-.12530	.00040	-3.38440	.00000	.53990	.00000	.00000
4.450	148.710	5.40930	.51950	-.18860	-.08600	-.00510	-2.70950	.00000	.55870	.00000	.00000
4.450	146.680	5.99350	.58790	-.20540	-.05820	-.00430	-2.77730	.00000	.55850	.00000	.00000
4.450	144.620	6.60720	.74330	-.22260	-.09110	-.00340	-2.87990	.00000	.55740	.00000	.00000
4.450	142.550	7.20710	.87670	-.22740	-.07560	-.02030	-3.02750	.00000	.55660	.00000	.00000
4.450	140.530	7.77470	1.33950	-.18810	-.08610	-.01490	-3.16170	.00000	.55250	.00000	.00000
4.450	138.460	8.79560	2.04120	-.25250	-.09630	-.01230	-3.12070	.00000	.54760	.00000	.00000
4.450	136.450	9.93220	2.11510	-.24790	-.12510	-.01300	-2.86140	.00000	.54920	.00000	.00000
4.450	146.670	5.99320	.60520	-.21170	-.08870	-.01170	-2.78270	.00000	.55930	.00000	.00000
	GRADIENT	-.32256	-.03052	.00498	.00079	.00139	-.00064	.00000	-.00079	.00000	.00000

MSFC 590(SA26F) 142-IN. SRB(139) NBRE1A (R95034) (11 DEC 73)

REFERENCE DATA

SREF = .5030 SQ. IN XMRP = 5.5570 IN.
LREF = .8000 IN. YMRP = .0000 IN.
BREF = .8000 IN. ZMRP = .0000 IN.
SCALE = .0056

PARAMETRIC DATA

BETA = .000 PHI = .000
FWDSTK = .000 AFTSTK = .000
ATHRNG = 1.000 ATHS = .000
CONFIG = 1.000 SHDSTK = .000
ELT = .000 SEPRKT = .000

RUN NO. 113/ 0 RN/L = 5.20 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CPB1	CPB2
2.740	148.210	5.92000	.69660	-.23830	-.12040	.01460	-3.44840	.00000	.55690	.00000	.00000
2.740	146.250	6.46380	1.05950	-.23860	-.12900	.00970	-3.56880	.00000	.55320	.00000	.00000
2.740	142.080	7.77860	.77080	-.26420	-.09750	.02120	-3.32340	.00000	.55940	.00000	.00000
2.740	137.880	9.13450	.77510	-.29070	-.07350	.01370	-3.26250	.00000	.55960	.00000	.00000
2.740	133.710	10.39290	1.21230	-.30450	-.05210	-.08030	-3.15300	.00000	.55700	.00000	.00000
2.740	129.570	11.62980	1.96100	-.31070	-.05260	.00670	-2.90460	.00000	.55280	.00000	.00000
2.740	127.600	12.24120	2.09060	-.30340	-.04300	.00360	-2.73510	.00000	.55260	.00000	.00000
2.740	137.880	9.13440	.77540	-.29470	-.07370	.01400	-3.26250	.00000	.55960	.00000	.00000
	GRADIENT	-.30835	-.06133	.00373	-.00420	.00146	-.03519	.00000	.00014	.00000	.00000

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                                   MSFC 590(SA26F) 142-IN. SRB(139) NBRE1A                               (R95035)   ( 11 DEC 73  )

              REFERENCE DATA                                                                         PARAMETRIC DATA

BREF  =      .5030 SQ. IN   XMRP  =     5.5570 IN.                                            BETA   =      .000  PHI     =      .000
LREF  =      .8000 IN.      YMRP  =      .0000 IN.                                            FWDSTK =      .000  AFTSTK  =      .000
BREF  =      .8000 IN.      ZMRP  =      .0000 IN                                             ATHRNG =     1.000  ATHS    =      .000
SCALE =      .0056                                                                            CONFIG =     1.000  SHDSTK  =      .000
                                                                                              ELT    =      .000  SEPRKT  =      .000

                       RUN NO.  114/ 0    RN/L =   5.20    GRADIENT INTERVAL =  -5.00/  5.00

   MACH      ALPHA       CNM        CLMM       CYM        CYNM       CBL        CA         CAB        XCP/L      CPB1       CPB2
   2.740    169.770     .71840    -.63360    -.04280     .10720     .00580   -2.39310     .00000     .63850     .00000     .00000
   2.740    167.820    1.09020    -.54630    -.08400     .03130     .00480   -2.45580     .00000     .60740     .00000     .00000
   2.740    163.720    1.88970    -.20600    -.15400    -.03190     .00900   -2.62190     .00000     .57500     .00000     .00000
   2.740    159.600    2.88410     .15020    -.17580     .07990     .00000   -2.81660     .00000     .56240     .00000     .00000
   2.740    155.440    4.10840     .40780    -.18740     .02600    -.00530   -3.04240     .00000     .55840     .00000     .00000
   2.740    151.290    5.33560     .67980    -.19160    -.03320    -.00070   -3.30510     .00000     .55610     .00000     .00000
   2.740    149.310    5.94960     .82840    -.18670    -.11260     .01550   -3.47280     .00000     .55520     .00000     .00000
   2.740    159.600    2.94840     .14770    -.17170     .08580    -.00560   -2.62040     .00000     .56240     .00000     .00000
            GRADIENT   -.25610    -.07267     .00657     .00670     .00001     .03211     .00000     .00353     .00000     .00000

                                   MSFC 590(SA26F) 142-IN. SRB(139) NBRE1A                               (R95036)   ( 11 DEC 73  )

              REFERENCE DATA                                                                         PARAMETRIC DATA

BREF  =      .5030 SQ. IN   XMRP  =     5.5570 IN.                                            BETA   =      .000  PHI     =      .000
LREF  =      .8000 IN.      YMRP  =      .0000 IN.                                            FWDSTK =      .000  AFTSTK  =      .000
BREF  =      .8000 IN.      ZMRP  =      .0000 IN.                                            ATHRNG =     1.000  ATHS    =      .000
SCALE =      .0056                                                                            CONFIG =     1.000  SHDSTK  =      .000
                                                                                              ELT    =      .000  SEPRKT  =      .000

                       RUN NO.  115/ 0    RN/L =   5.20    GRADIENT INTERVAL =  -5.00/  5.00

   MACH      ALPHA       CNM        CLMM       CYM        CYNM       CBL        CA         CAB        XCP/L      CPB1       CPB2
   2.740    190.340    -.76650     .23190    -.04720     .01320    -.00470   -2.43220     .00000     .59120     .00000     .00000
   2.740    188.400    -.45220     .27970    -.04190     .02920    -.00220   -2.37020     .00000     .61700     .00000     .00000
   2.740    184.350    -.13760     .25390    -.03710     .07910     .00210   -2.24800     .00000     .71700     .00000     .00000
   2.740    180.320     .01760    -.07880    -.03370     .07600     .00700   -2.16890     .00000     .93080     .00000     .00000
   2.740    176.280     .19550    -.55310    -.04650     .08450    -.00720   -2.21070     .00000     .79720     .00000     .00000
   2.740    172.190     .43970    -.75930    -.03380     .07530    -.00660   -2.31970     .00000     .70740     .00000     .00000
   2.740    170.290     .63300    -.67500    -.02530     .07520     .00270   -2.39890     .00000     .65350     .00000     .00000
   2.740    180.320     .00610    -.10150    -.03790     .09260    -.01410   -2.16870     .00000    1.59470     .00000     .00000
            GRADIENT   -.06192     .05691    -.00063    -.00278    -.00000    -.00244     .00000    -.00457     .00000     .00000
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                                 MSFC 590(SA26F) 142-IN. SRB(139) NBRE1A                    (R95037)   ( 11 DEC 73  )

               REFERENCE DATA                                                                   PARAMETRIC DATA

SREF  =       .5030 SQ. IN   XMRP  =     5.5570 IN.                                BETA    =       .000   PHI     =       .000
LREF  =       .8000 IN.      YMRP  =      .0000 IN.                                FWDSTK  =       .000   AFTSTK  =       .000
BREF  =       .8000 IN.      ZMRP  =      .0000 IN.                                ATHRNG  =      1.000   ATHS    =       .000
SCALE =       .0056                                                                CONFIG  =      1.000   SHDSTK  =       .000
                                                                                   ELT     =       .000   SEPRKT  =       .000

                           RUN NO.   112/ 0    RN/L =   5.22    GRADIENT INTERVAL =  -5.00/  5.00

  MACH      ALPHA      CNM        CLMM       CYM        CYNM       CBL        CA         CAB        XCP/L      CFB1       CFB2
  2.740   156.590    3.83110     .55150    -.17260    -.01290     .00170   -2.94630    .00000     .55450     .00000     .00000
  2.740   154.600    4.39930     .69220    -.18470    -.03190     .00880   -3.06880    .00000     .55370     .00000     .00000
  2.740   150.470    5.63790    1.04330    -.18830    -.14200     .00760   -3.33890    .00000     .55150     .00000     .00000
  2.740   146.320    6.84120    1.72230    -.21880    -.09350    -.00090   -3.58080    .00000     .54600     .00000     .00000
  2.740   142.090    8.26810    1.30220    -.24510    -.06730     .00560   -3.23620    .00000     .55370     .00000     .00000
  2.740   137.900    9.59670    1.53870    -.27230     .00040    -.00060   -3.20840    .00000     .55310     .00000     .00000
  2.740   135.950   10.16970    1.86910    -.24040    -.01740     .00230   -3.13130    .00000     .55150     .00000     .00000
  2.740   146.290    6.91010    1.22820    -.22670    -.09140     .00980   -3.34210    .00000     .55200     .00000     .00000
          GRADIENT   -.30908    -.05606     .00431    -.00140     .00021     .00691     .00000     .00007     .00000     .00000

                                 MSFC 590(SA26F) 142-IN. SRB(139) NBRE1                     (R95038)   ( 11 DEC 73  )

               REFERENCE DATA                                                                   PARAMETRIC DATA

SREF  =       .5030 SQ. IN   XMRP  =     5.5570 IN.                                BETA    =       .000   PHI     =       .000
LREF  =       .8000 IN.      YMRP  =      .0000 IN.                                FWDSTK  =       .000   AFTSTK  =       .000
BREF  =       .8000 IN.      ZMRP  =      .0000 IN.                                ATHRNG  =      1.000   ATHS    =       .000
SCALE =       .0056                                                                CONFIG  =      2.000   SHDSTK  =       .000
                                                                                   ELT     =       .000   SEPRKT  =       .000

                           RUN NO.   118/ 0    RN/L =   5.20    GRADIENT INTERVAL =  -5.00/  5.00

  MACH      ALPHA      CNM        CLMM       CYM        CYNM       CBL        CA         CAB        XCP/L      CFB1       CFB2
  2.740    32.610    7.00400    5.57370     .27800     .19590     .00000    1.04230     .20100     .50160    -.10540    -.11540
  2.740    33.990    7.68000    5.77470     .28310     .18450     .02960    1.08280     .20790     .50520    -.10560    -.12350
  2.740    38.160    9.08800    6.24930     .30560     .18140    -.00640    1.15640     .22290     .51040    -.11320    -.13240
  2.740    42.330   10.48730    6.85160     .32430     .19910    -.00010    1.20260     .22110     .51320    -.10610    -.13990
  2.740    46.530   11.89720    7.57140     .33890     .21530     .00130    1.23600     .21620     .51460    -.09720    -.14340
  2.740    50.730   13.27640    8.09560     .34490     .19720     .01120    1.27410     .21010     .51680    -.09180    -.14270
  2.740    52.690   13.89100    8.45950     .33710     .17470    -.00380    1.27190     .19590     .51690    -.07840    -.14160
  2.740    42.330   10.47900    6.85630     .31690     .24530     .01460    1.20000     .22320     .51320    -.10560    -.14190
          GRADIENT    .33372     .14089     .00326     .00007    -.00041     .01107    -.00016     .00079     .00119    -.00123
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                          MSFC 590(SA26F) 142-IN. SRB(1    NBRE1                 (R95039)   ( 11 DEC 73  )

            REFERENCE DATA                                                         PARAMETRIC DATA

SREF  =     .5030 SQ. IN   XMRP  =    5.5570 IN.                            BETA   =     .000   PHI     =    .000
LREF  =     .8000 IN.      YMRP  =     .0000 IN.                            FWDSTK =     .000   AFTSTK  =    .000
BREF  =     .8000 IN.      ZMRP  =     .0000 IN.                            ATHRNG =    1.000   ATHS    =    .000
SCALE =     .0056                                                           CONFIG =    2.000   SHDSTK  =    .000
                                                                            ELT    =     .000   SEPRKT  =    .000

                      RUN NO.  116/ 0    RN/L =   5.19    GRADIENT INTERVAL =  -5.00/  5.00

  MACH     ALPHA      CNM       CLMM       CYM       CYNM       CBL        CA        CAB      XCP/L      CPB1      CPB2
  2.740   -10.190  -1.34800  -2.83580   .09900    .16100    .00290    .90300    .25080    .39490   -.13100   -.14470
  2.740    -8.220   -.92090  -2.27620   .07870    .20680    .00450    .89110    .24870    .36490   -.12720   -.14670
  2.740    -4.130   -.37440  -1.03250   .06580    .21770    .00660    .86440    .23080    .34160   -.11040   -.14530
  2.740     -.030   -.04050   -.04260   .05800    .14720    .00100    .85410    .22020    .49070   -.10270   -.14170
  2.740     4.050    .32170    .80540   .06070    .19820    .00460    .86890    .22070    .36230   -.10320   -.14170
  2.740     8.170    .74460   1.98280   .06640    .19210   -.01240    .90010    .23760    .34930   -.11870   -.14350
  2.740    10.130   1.07440   2.58840   .09150    .16500   -.08290    .90670    .24250    .37900   -.12190   -.14560
  2.740     -.040   -.06060   -.08790   .07350    .13370    .00290    .85300    .21970    .44930   -.10220   -.14170
          GRADIENT   .08509    .22470  -.00062   -.00240   -.00025    .00055   -.00124    .00256    .00098    .00044

                          MSFC 590(SA26F) 142-IN. SRB(139) NBRE1                 (R95040)   ( 11 DEC 73  )

            REFERENCE DATA                                                         PARAMETRIC DATA

SREF  =     .5030 SQ. IN   XMRP  =    5.5570 IN.                            BETA   =     .000   PHI     =    .000
LREF  =     .8000 IN.      YMRP  =     .0000 IN.                            FWDSTK =     .000   AFTSTK  =    .000
BREF  =     .8000 IN.      ZMRP  =     .0000 IN.                            ATHRNG =    1.000   ATHS    =    .000
SCALE =     .0056                                                           CONFIG =    2.000   SHDSTK  =    .000
                                                                            ELT    =     .000   SEPRKT  =    .000

                      RUN NO.  117/ 0    RN/L =   5.19    GRADIENT INTERVAL =  -5.00/  5.00

  MACH     ALPHA      CNM       CLMM       CYM       CYNM       CBL        CA        CAB      XCP/L      CPB1      CPB2
  2.740    10.320   1.17040   2.75250   .12480    .22410    .01810    .88860    .23970    .37470   -.12340   -.14050
  2.740    12.300   1.60480   3.21460   .13220    .23160    .00470    .89790    .24310    .40310   -.12650   -.14090
  2.740    16.420   2.65940   3.81750   .17090    .22170   -.00090    .88340    .23090    .44940   -.11550   -.13940
  2.740    20.590   3.79110   4.35330   .19590    .26070    .00090    .90260    .21060    .47250   -.10620   -.12630
  2.740    24.760   5.01180   4.73910   .24020    .23650    .00540    .94040    .19310    .48940   -.09960   -.11290
  2.740    28.940   6.34980   5.20750   .23530    .27320    .01110   1.01030    .18920    .49960   -.09850   -.10940
  2.740    30.900   6.99970   5.40370   .24760    .24420    .08310   1.04420    .18560    .50360   -.09810   -.10570
  2.740    20.580   3.77120   4.31930   .20340    .24810    .00900    .89650    .20630    .47310   -.10490   -.12240
          GRADIENT   .28384    .12389   .00626    .00117   -.00019    .00721   -.00304    .00596    .00145    .00192
```

MSFC 595(SA26F) 142-IN. SRB(139) NBRE1B (R95050) (07 MAR 74)

REFERENCE DATA

SREF = .5030 SQ. IN XMRP = 5.5570 IN.
LREF = .8000 IN. YMRP = .0000 IN.
BREF = .8000 IN. ZMRP = .0000 IN.
SCALE = .0036

PARAMETRIC DATA

BETA = .000 PHI = .000
FWDSTK = .000 AFTSTK = .000
ATHRNG = 1.000 ATHS = .000
CONFIG = 5.000 SHDSTK = .000
ELT = .000 SEPRKT = .000

RUN NO. 12/ 1 RN/L = 4.92 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CPB1	CPB2
.597	109.830	10.88910	-2.30980	-.04680	1.18030	-.18250	-.62930	.00000	.58380	.00000	.00000
.597	107.940	11.00660	-1.90890	-.05160	1.12200	-.16100	-.41390	.00000	.58070	.00000	.00000
.597	105.960	11.15080	-1.60570	-.06630	.99810	-.18270	-.17910	.00000	.57830	.00000	.00000
.597	103.950	11.25940	-1.10430	-.09960	1.00060	-.15610	.03200	.00000	.57450	.00000	.00000
.597	101.980	11.34830	-.51160	-.14550	.94300	-.14020	.23460	.00000	.57020	.00000	.00000
.597	99.980	11.39910	.26950	-.19540	1.01390	-.15280	.44110	.00000	.56460	.00000	.00000
.597	97.990	11.62 10	1.07720	-.19790	1.15690	-.15180	.65390	.00000	.55900	.00000	.00000
.597	96.000	11.67890	1.73420	-.12100	1.29670	-.14840	.75920	.00000	.55440	.00000	.00000
.597	94.040	11.58270	2.67770	-.17320	1.36630	-.13690	.87180	.00000	.54770	.00000	.00000
.597	92.040	11.65030	3.71290	-.16220	1.38760	-.14330	.98550	.00000	.54050	.00000	.00000
.597	90.160	11.70320	4.85270	-.15330	1.44350	-.11180	1.01990	.00000	.53270	.00000	.00000
.597	100.000	11.48400	.39120	-.17190	1.01380	-.11360	.45760	.00000	.56380	.00000	.00000
	GRADIENT	-.04161	-.36030	.00640	-.01973	-.00259	-.08674	.00000	.00257	.00000	.00000

RUN NO. 13/ 1 RN/L = 6.22 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CPB1	CPB2
.900	109.650	13.68370	-2.22860	.12970	.44680	-.10700	-.39330	.00000	.57980	.00000	.00000
.900	107.770	13.96280	-1.60480	.12100	.43150	-.12190	-.15390	.00000	.57590	.00000	.00000
.900	105.810	14.23960	-.82730	.11620	.46190	-.12240	.07030	.00000	.57130	.00000	.00000
.900	103.840	14.39930	.06490	.11930	.43900	-.11880	.30200	.00000	.56620	.00000	.00000
.900	101.870	14.65720	1.08070	.10420	.45030	-.12740	.48390	.00000	.56050	.00000	.00000
.900	99.880	14.87690	2.28900	.10170	.48330	-.12020	.66400	.00000	.55400	.00000	.00000
.900	97.940	15.10180	4.04190	.15030	.60940	-.11340	.76690	.00000	.54470	.00000	.00000
.900	95.980	15.41290	5.68710	.15490	.60810	-.10620	.85130	.00000	.53640	.00000	.00000
.900	94.030	15.55070	6.64120	.14420	.56020	-.08490	.94040	.00000	.53170	.00000	.00000
.900	92.050	15.64410	7.47810	.12600	.58380	-.09350	1.00140	.00000	.52750	.00000	.00000
.900	90.170	15.66370	8.32080	.11350	.63230	-.10010	1.02330	.00000	.52320	.00000	.00000
.900	99.910	15.01380	2.55390	.14640	.54380	-.07260	.65160	.00000	.55270	.00000	.00000
	GRADIENT	-.10700	-.58393	-.00066	-.01082	-.00139	-.07293	.00000	.00312	.00000	.00000

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DATE 08 NOV 74                    TABULATED SOURCE DATA,  MSFC TWT 590/595                                   PAGE   59

                                   MSFC 595(SA26F) 142-IN. SRB(139) NBRE1B                    (R95050)   ( 07 MAR 74  )

              REFERENCE DATA                                                                  PARAMETRIC DATA

SREF  =       .5033 SQ. IN   XMRP  =     5.5570 IN.                         BETA   =       .000   PHI    =        .000
LREF  =       .8000 IN.      YMRP  =      .0000 IN.                         FWDSTK =       .000   AFTSTK =        .000
BREF  =       .8000 IN.      ZMRP  =      .0000 IN.                         ATHRNG =      1.000   ATMS   =        .000
SCALE =       .0056                                                         CONFIG =      5.000   SMDSTK =        .000
                                                                            ELT    =       .000   SEPRKT =        .000

                              RUN NO.   14/ 1    RN/L =   6.63   GRADIENT INTERVAL =  -5.00/  5.00

  MACH     ALPHA      CNM        CLMM       CYM       CYNM       CBL        CA        CAB      XCP/L      CPB1      CPB2
 1.196    109.790   17.10770    5.03630    .17620    .17440   -.03620   -.70050    .00000    .54250    .00000    .00000
 1.196    107.930   17.36460    5.68950    .17690    .22820   -.03220   -.50560    .00000    .53980    .00000    .00000
 1.196    105.930   17.65870    6.57860    .18660    .28200   -.03900   -.31420    .00000    .53610    .00000    .00000
 1.196    103.950   18.04630    7.22200    .21610    .39430   -.03440   -.12490    .00000    .53390    .00000    .00000
 1.196    101.990   18.37240    7.84700    .25940    .47780   -.02880    .06990    .00000    .53170    .00000    .00000
 1.196     99.970   18.53640    7.86210    .23520    .42570   -.03790    .23190    .00000    .53190    .00000    .00000
 1.196     97.990   18.83000    8.51710    .23890    .42140   -.03660    .39470    .00000    .52960    .00000    .00000
 1.196     96.000   19.01570    9.10410    .24100    .39880   -.03770    .55670    .00000    .52750    .00000    .00000
 1.196     94.030   19.23690    9.79190    .23660    .41610   -.03000    .71580    .00000    .52500    .00000    .00000
 1.196     92.060   19.48680   10.63510    .25000    .37450   -.02300    .85960    .00000    .52200    .00000    .00000
 1.196     90.160   19.58020   11.30210    .23460    .36170   -.02700    .98190    .00000    .51940    .00000    .00000
 1.196     99.960   18.45070    7.69060    .21950    .35730   -.02960    .23430    .00000    .53250    .00000    .00000
          GRADIENT   -.12852    -.29996   -.00352   -.00864   -.00042   -.09588    .00000    .00109    .00000    .00000
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                              MSFC 595(SA26F) 142-IN. SRB(139) NBRE1B                        (R95D51)    ( 07 MAR 74  )

               REFERENCE DATA                                                              PARAMETRIC DATA

SREF  =      .5030 SQ. IN   XMRP  =     5.5570 IN.                         BETA    =      .000   PHI     =      .000
LREF  =      .9000 IN.      YMRP  =      .0000 IN.                         FWDSTK  =      .000   AFTSTK  =      .000
BREF  =      .8000 IN.      ZMRP  =      .0000 IN.                         ATHRNG  =     1.000   ATHS    =      .000
SCALE =      .0036                                                         CCNFIG  =     5.000   SHDSTK  =      .000
                                                                           ELT     =      .000   SEPRKT  =      .000

                       RUN NO.   16/ 0    RN/L =   6.25    GRADIENT INTERVAL =  -5.00/  5.00

 MACH     ALPHA      CNM       CLMM       CYM       CYNM       CBL        CA        CAB      XCP/L      CPB1      CPB2
  .901   129.490    9.55280  -5.59140    .01140    .20420   -.05340  -2.49090    .00000    .61430    .00000    .00000
  .901   127.540   10.06860  -5.61620    .02250    .29180   -.04850  -2.36230    .00000    .61200    .00000    .00000
  .901   125.550   10.63710  -5.45150    .02520    .30080   -.04120  -2.19960    .00000    .60830    .00000    .00000
  .901   123.520   11.22400  -5.41750    .06240    .20810   -.05160  -2.04060    .00000    .60590    .00000    .00000
  .901   121.520   11.70880  -5.28140    .08760    .24370   -.04330  -1.81830    .00000    .60330    .00000    .00000
  .901   119.510   12.25060  -5.09440    .09510    .32280   -.02340  -1.59500    .00000    .60040    .00000    .00000
  .901   117.490   12.60150  -4.78250    .10450    .31490   -.02960  -1.36630    .00000    .59750    .00000    .00000
  .901   115.520   12.94770  -4.29410    .10470    .30900   -.02600  -1.13450    .00000    .59360    .00000    .00000
  .901   113.540   13.23270   3.64990    .08620    .35850   -.02640    -.87840    .00000    .59930    .00000    .00000
  .901   111.550   13.61860  -2.97130    .10370    .38200   -.02850    -.64090    .00000    .59430    .00000    .00000
  .901   109.650   13.97390  -2.09930    .10420    .39910   -.03970    -.39210    .00000    .57880    .00000    .00000
  .901   119.510   12.20320  -5.14790    .06690    .30520   -.04830  -1.59810    .00000    .60090    .00000    .00000
         GRADIENT    -.22102   -.16476   -.00491   -.00811   -.00120    -.10768    .00000    .00172    .00000    .00000

                       RUN NO.   15/ 0    RN/L =   6.67    GRADIENT INTERVAL =  -5.00/  5.00

 MACH     ALPHA      CNM       CLMM       CYM       CYNM       CBL        CA        CAB      XCP/L      CPB1      CPB2
 1.197   129.510   12.44720   -.52840    .11250    .15440   -.06160  -2.65360    .00000    .57000    .00000    .00000
 1.197   127.590   13.00620   -.38550    .15660    .15270   -.04730  -2.51420    .00000    .56890    .00000    .00000
 1.197   125.610   13.61320    .14030    .17660    .18170   -.03930  -2.35010    .00000    .56570    .00000    .00000
 1.197   123.600   14.24370    .66550    .20380    .18020   -.05290  -2.19360    .00000    .56270    .00000    .00000
 1.197   121.610   14.84720   1.25180    .20590    .19520   -.04550  -1.99080    .00000    .55970    .00000    .00000
 1.197   119.620   15.40290   1.85190    .21390    .18110   -.04110  -1.77640    .00000    .55670    .00000    .00000
 1.197   117.610   15.90090   2.44560    .21530    .23340   -.05330  -1.56340    .00000    .55400    .00000    .00000
 1.197   115.640   16.35030   3.06630    .22850    .26440   -.04070  -1.33520    .00000    .55120    .00000    .00000
 1.197   113.660   16.76200   3.59910    .23820    .27290   -.04100  -1.12100    .00000    .54910    .00000    .00000
 1.197   111.670   17.13390   4.14830    .24640    .29590   -.03880    -.90250    .00000    .54690    .00000    .00000
 1.197   109.770   17.47200   4.77560    .25920    .32580   -.04190    -.69410    .00000    .54420    .00000    .00000
 1.197   119.620   15.38720   1.97950    .19950    .18130   -.03660  -1.77410    .00000    .55600    .00000    .00000
         GRADIENT    -.25835   -.27983   -.00812   -.00878   -.00068    -.10119    .00000    .00136    .00000    .00000
```

MSFC 595(SA26F) 142-IN. SRB(139) NBRE1B (R95032) (07 MAR 74)

REFERENCE DATA

SREF = .5030 SQ. IN XMRP = 5.5570 IN.
LREF = .8000 IN. YMRP = .0000 IN.
BREF = .8000 IN. ZMRP = .0000 IN.
SCALE = .0058

PARAMETRIC DATA

BETA = .000 PHI = .000
FLOSTK = .000 AFTSTK = .000
ATMRNG = 1.000 ATMS = .000
CONFIG = 5.000 SHOSTK = .000
ELT = .000 SEPRKT = .000

RUN NO. 11/ 0 RN/L = 6.78 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CPB1	CPB2
1.958	148.700	6.69320	.96540	.02560	-.01940	-.00170	-3.40220	.00000	.55480	.00000	.00000
1.958	146.680	7.38740	1.13590	.00910	.02970	-.00350	-3.38130	.00000	.55380	.00000	.00000
1.958	144.600	8.14240	1.49410	.04730	-.02500	-.00450	-3.35650	.00000	.55160	.00000	.00000
1.958	142.480	8.84000	1.63530	.05300	-.00210	-.01280	-3.29270	.00000	.55140	.00000	.00000
1.958	140.390	9.54040	1.80140	.09420	.11460	-.01160	-3.22170	.00000	.55110	.00000	.00000
1.958	138.240	10.31600	2.13960	.08320	.05170	-.01520	-3.13560	.00000	.54960	.00000	.00000
1.958	136.150	10.97920	2.51710	.07280	.01700	-.02440	-3.03560	.00000	.54780	.00000	.00000
1.958	134.030	11.72410	2.67170	.10370	.05980	-.03010	-2.91300	.00000	.54790	.00000	.00000
1.958	[illegible]	12.35420	2.88970	.11540	.05190	-.02900	-2.76490	.00000	.54750	.00000	.00000
1.958	129.880	12.86920	3.13440	.12150	.05150	-.02430	-2.57810	.00000	.54670	.00000	.00000
1.958	127.830	13.46120	2.83380	.17750	.20590	-.04790	-2.36770	.00000	.54940	.00000	.00000
1.958	138.280	10.19370	2.08700	.10000	.14000	-.03070	-3.12470	.00000	.54990	.00000	.00000
	GRADIENT	-.32792	-.10515	-.00647	-.00636	.00187	-.04810	.00000	.00034	.00000	.00000

RUN NO. 4/ 0 RN/L = 4.60 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CPB1	CPB2
2.740	149.170	5.99340	1.36740	.01690	.00430	-.02690	-3.46860	.00000	.54790	.00000	.00000
2.740	147.210	6.61460	1.51700	.04000	-.03930	-.00910	-3.40800	.00000	.54780	.00000	.00000
2.740	145.150	7.23930	1.68980	.04430	-.03110	-.00610	-3.35290	.00000	.54750	.00000	.00000
2.740	143.090	7.90050	1.77720	.05870	-.03520	-.03650	-3.29190	.00000	.54820	.00000	.00000
2.740	141.030	8.53160	1.92900	.05510	-.04850	-.03650	-3.20130	.00000	.54910	.00000	.00000
2.740	138.970	9.13230	2.05670	.06020	-.05080	-.03800	-3.09920	.00000	.54920	.00000	.00000
2.740	136.890	9.83520	1.84680	.05990	-.02350	-.05750	-2.90440	.00000	.55120	.00000	.00000
2.740	134.830	10.47820	1.99670	.06490	-.03700	-.06940	-2.77510	.00000	.55100	.00000	.00000
2.740	132.790	11.13920	2.16920	.07770	-.02900	-.07860	-2.67440	.00000	.55060	.00000	.00000
2.740	130.710	11.75460	2.38090	.08170	-.04130	-.07380	-2.53890	.00000	.55000	.00000	.00000
2.740	128.740	12.32820	2.65770	.09370	-.05350	-.08680	-2.36470	.00000	.54890	.00000	.00000
2.740	139.970	9.15090	2.01470	.06020	-.02160	-.09160	-3.10130	.00000	.54860	.00000	.00000
	GRADIENT	-.31162	-.05175	-.00295	.00118	.00382	-.05473	.00000	-.00314	.00000	.00000

MSFC 595(SA26F) 142-IN. SRB(139) NBRE1B (R95052) (07 MAR 74)

REFERENCE DATA

SREF = .5030 SQ. IN XMRP = 5.5570 IN.
LREF = .8000 IN. YMRP = .0000 IN.
BREF = .8000 IN. ZMRP = .0000 IN.
SCALE = .0056

PARAMETRIC DATA

BETA = .000 PHI = .000
FWDSTK = .000 AFTSTK = .000
ATHRNG = 1.000 ATHS = .000
CONFIG = 5.000 SHDSTK = .000
ELT = .000 SEPRKT = .000

RUN NO. 5/ 0 RN/L = 6.30 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CPB1	CPB2
3.480	149.180	5.56190	1.54800	.06080	.01430	-.03670	-3.46340	.00000	.54380	.00000	.00000
3.480	147.220	6.16090	1.66900	.06580	.00140	-.04770	-3.40830	.00000	.54440	.00000	.00000
3.480	145.160	6.73830	1.78990	.07860	-.00130	-.06030	-3.34190	.00000	.54490	.00000	.00000
3.480	143.100	7.35920	1.89090	.08390	-.01430	-.07650	-3.24630	.00000	.54560	.00000	.00000
3.480	141.030	8.03640	1.61440	.09350	-.03700	-.06930	-3.00990	.00000	.55010	.00000	.00000
3.480	138.940	8.68160	1.67500	.09900	-.04960	-.06970	-2.89800	.00000	.55090	.00000	.00000
3.480	136.870	9.35850	1.85540	.10180	-.02270	-.07410	-2.77300	.00000	.55040	.00000	.00000
3.480	134.810	9.98760	2.01500	.10560	-.01590	-.09230	-2.65080	.00000	.55010	.00000	.00000
3.480	132.760	10.63230	2.19400	.10910	-.01790	-.08980	-2.50910	.00000	.54970	.00000	.00000
3.480	130.700	11.24570	2.45100	.12060	-.04910	-.09390	-2.34890	.00000	.54990	.00000	.00000
3.480	128.730	11.84210	2.67000	.12280	-.01200	-.10980	-2.19940	.00000	.54910	.00000	.00000
3.480	138.940	8.70000	1.69500	.11500	-.05110	-.11310	-2.89600	.00000	.55060	.00000	.00000
	GRADIENT	-.30912	-.04607	-.00297	.00165	.00297	-.06402	.00000	-.00028	.00000	.00000

RUN NO. 6/ 0 RN/L = 4.97 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CPB1	CPB2
4.959	149.540	4.90340	2.44550	.08870	.00650	-.05780	-3.39630	.00000	.52580	.00000	.00000
4.959	147.620	5.48050	2.58050	.06690	.02470	-.07060	-3.37440	.00000	.52810	.00000	.00000
4.959	145.590	6.05560	2.71370	.06360	.00200	-.03380	-3.26940	.00000	.53000	.00000	.00000
4.959	143.550	6.74390	2.36300	.10140	.02030	-.04920	-3.07700	.00000	.53790	.00000	.00000
4.959	141.520	7.39050	2.45170	.08030	.01630	-.05990	-2.99650	.00000	.53950	.00000	.00000
4.959	139.490	8.02940	2.72610	.11220	-.02780	-.03640	-2.89590	.00000	.53980	.00000	.00000
4.959	137.460	8.65590	2.94090	.08740	.03440	-.05330	-2.81430	.00000	.53890	.00000	.00000
4.959	135.440	9.26380	3.20690	.10050	.01110	-.04210	-2.73830	.00000	.53830	.00000	.00000
4.959	133.430	9.91650	3.38710	.11340	.05110	-.08350	-2.66520	.00000	.53970	.00000	.00000
4.959	131.380	10.52480	3.69490	.10830	.00640	-.05710	-2.53370	.00000	.53790	.00000	.00000
4.959	129.430	11.17460	3.83000	.12160	.04670	-.08670	-2.45840	.00000	.53960	.00000	.00000
4.959	139.500	7.96940	2.76320	.09240	.01550	-.05060	-2.89020	.00000	.53820	.00000	.00000
	GRADIENT	-.31230	-.77098	-.00218	-.00123	.00099	-.04821	.00000	-.00059	.00000	.00000

MSFC 595(SA26F) 142-IN. SRB(139) NBRE18 (R95D53) (07 MAR 74)

REFERENCE DATA

SREF = .5030 SQ. IN XMRP = 5.5570 IN.
LREF = .8000 IN. YMRP = .0000 IN.
BREF = .8000 IN. ZMRP = .0000 IN.
SCALE = .0056

PARAMETRIC DATA

BETA = .000 PHI = .000
FWDSTK = .000 AFTSTK = .000
ATMRNG = 1.000 ATMS = .000
CONFIG = 5.000 SHDSTK = .000
ELT = .000 SEPRKT = .000

RUN NO. 10/ 0 RN/L = 6.73 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CPB1	CPB2
1.955	168.740	.81860	-1.22410	.00980	-.17350	-.00690	-3.37810	.00000	.68850	.00000	.00000
1.955	166.750	1.18730	-1.45790	.15990	.17960	.00870	-3.39180	.00000	.66670	.00000	.00000
1.955	164.690	1.62700	-1.53450	-.14600	-.35580	-.00220	-3.44860	.00000	.64350	.00000	.00000
1.955	162.580	2.17150	-1.51780	-.14170	-.32330	-.00260	-3.46690	.00000	.62350	.00000	.00000
1.955	160.490	2.77230	-1.20740	-.07020	.06410	.02040	-3.50290	.00000	.60440	.00000	.00000
1.955	158.400	3.41480	-.99060	-.06520	.09040	.00920	-3.51250	.00000	.59020	.00000	.00000
1.955	156.330	4.01330	-.47450	.02640	.13540	.01170	-3.45570	.00000	.57620	.00000	.00000
1.955	154.250	4.62970	-.06350	.00910	.11350	.01260	-3.43700	.00000	.56760	.00000	.00000
1.955	152.160	5.30470	.28000	.05490	-.03940	.00650	-3.42220	.00000	.56220	.00000	.00000
1.955	150.050	6.05560	.58530	.05490	-.07560	.00010	-3.41390	.00000	.55860	.00000	.00000
1.955	148.030	6.74190	.78940	.03160	-.03840	.00290	-3.39560	.00000	.55700	.00000	.00000
1.955	158.440	3.36040	-.65280	-.02940	.14120	.01050	-3.42560	.00000	.59240	.00000	.00000
	GRADIENT	-.28979	-.11991	-.00412	-.00676	-.00027	-.00005	.00000	.00644	.00000	.00000

RUN NO. 3/ 0 RN/L = 4.61 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CPB1	CPB2
2.740	168.840	.70040	-.67480	.04060	.02790	-.01620	-3.48430	.00000	.64510	.00000	.00000
2.740	166.900	1.06810	-.56220	.09640	.11420	.01570	-3.48210	.00000	.60950	.00000	.00000
2.740	164.860	1.50970	-.35870	-.03250	-.08300	-.00210	-3.47950	.00000	.59590	.00000	.00000
2.740	162.830	1.95800	-.10490	-.06990	-.15070	-.02830	-3.49450	.00000	.57090	.00000	.00000
2.740	160.790	2.39540	.15660	-.03350	-.06450	.01020	-3.49150	.00000	.56120	.00000	.00000
2.740	158.740	2.91560	.35380	-.01390	.03860	-.01930	-3.49220	.00000	.55650	.00000	.00000
2.740	156.700	3.45530	.67610	.01510	.02770	-.00550	-3.47990	.00000	.55060	.00000	.00000
2.740	154.650	4.03080	.90740	.04140	-.16550	-.01410	-3.48340	.00000	.54920	.00000	.00000
2.740	152.610	4.63810	.99990	.04310	.00000	-.04210	-3.48300	.00000	.54930	.00000	.00000
2.740	150.530	5.31320	1.19420	.02950	.01790	-.03880	-3.48340	.00000	.54920	.00000	.00000
2.740	148.550	5.92250	1.32520	.05190	.02570	-.04840	-3.47450	.00000	.54830	.00000	.00000
2.740	158.750	2.89890	.41700	-.01420	.02680	-.05240	-3.50020	.00000	.55490	.00000	.00000
	GRADIENT	-.25743	-.10551	-.00129	.00037	.00217	-.00030	.00000	.00399	.00000	.00000

DATE 08 NOV 74

TABULATED SOURCE DATA, MSFC TWT 590/595

MSFC 595(SA26F) 142-IN. SRB(139) NBRE1B

(R95053) (07 MAR 74)

REFERENCE DATA

SREF = .5030 SQ. IN
LREF = .8000 IN.
BREF = .8000 IN.
SCALE = .0056

XMRP = 5.5570 IN.
YMRP = .0000 IN.
ZMRP = .0000 IN.

PARAMETRIC DATA

BETA = .000
FWDSTK = .000
ATHRNG = 1.000
CONFIG = 5.000
ELT = .000

PHI = .000
AFTSTK = .000
ATHS = .000
SHDSTK = .000
SEPRKT = .000

RUN NO. 2/ 0 RN/L = 6.20 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CPB1	CPB2
3.480	168.850	.61880	-.28970	.04110	.08530	-.02620	-3.44340	.00000	.60470	.00000	.00000
3.480	166.930	.92170	-.09390	.00720	-.00570	-.02640	-3.44020	.00000	.57490	.00000	.00000
3.480	164.900	1.27780	.18460	.02720	-.02520	-.01390	-3.44900	.00000	.55470	.00000	.00000
3.480	162.870	1.66170	.42090	-.00800	-.06770	-.02960	-3.45230	.00000	.54590	.00000	.00000
3.480	160.830	2.09560	.70070	-.00570	-.02960	-.02960	-3.45330	.00000	.53930	.00000	.00000
3.480	158.730	2.56290	.92120	-.01070	-.00170	-.02260	-3.45090	.00000	.53720	.00000	.00000
3.480	156.710	3.10100	1.12170	.05920	-.06150	-.02950	-3.45110	.00000	.53700	.00000	.00000
3.480	154.690	3.64680	1.26090	.04820	-.07520	-.04960	-3.44620	.00000	.53930	.00000	.00000
3.480	152.640	4.21260	1.36490	.05980	-.01750	-.02560	-3.45810	.00000	.54010	.00000	.00000
3.480	150.550	4.82220	1.40700	.04860	.01770	-.03440	-3.47750	.00000	.54270	.00000	.00000
3.480	148.570	5.45110	1.54810	.05290	.02380	-.05260	-3.46270	.00000	.54340	.00000	.00000
3.480	158.780	2.57830	.93970	-.01010	-.03190	-.03580	-3.45040	.00000	.53680	.00000	.00000
	GRADIENT	-.23892	-.09287	-.00225	.00059	.00103	.00116	.00000	.00220	.00000	.00000

RUN NO. 1/ 0 RN/L = 5.02 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CPB1	CPB2
4.959	168.910	.39670	-.04930	-.02290	-.21940	-.00140	-3.30790	.00000	.57670	.00000	.00000
4.959	167.010	.61340	.21870	-.01070	-.15300	.03200	-3.29020	.00000	.53740	.00000	.00000
4.959	165.000	.93780	.53500	-.00240	.34320	-.03010	-3.32370	.00000	.52000	.00000	.00000
4.959	162.990	1.29570	.97670	-.00940	.00140	.03090	-3.30870	.00000	.50500	.00000	.00000
4.959	160.970	1.73240	1.37740	.03930	.00090	.01340	-3.32140	.00000	.50170	.00000	.00000
4.959	158.950	2.19530	1.64220	-.02020	.03980	-.02220	-3.35360	.00000	.50550	.00000	.00000
4.959	156.930	2.69810	1.82100	-.02460	.06100	.01010	-3.35910	.00000	.51150	.00000	.00000
4.959	154.910	3.23900	1.91140	-.02800	.09980	-.04110	-3.36690	.00000	.51940	.00000	.00000
4.959	152.900	3.78780	2.08960	.07910	-.02960	.00770	-3.39020	.00000	.52150	.00000	.00000
4.959	150.860	4.36290	2.13550	.05820	.00870	-.03030	-3.41910	.00000	.52660	.00000	.00000
4.959	148.910	4.93950	2.26990	.07360	-.03530	.01840	-3.40160	.00000	.52910	.00000	.00000
4.959	158.960	2.20030	1.73100	.03380	-.00290	-.03470	-3.35560	.00000	.50240	.00000	.00000
	GRADIENT	-.23126	-.11959	-.00407	-.00723	.00029	.00606	.00000	.00107	.00000	.00000

MSFC 595(BA26F) 142-IN. SRB(138) NBRE1B (RB5054) (07 MAR 74)

REFERENCE DATA

SREF = .5030 SQ. IN XMRP = 5.5570 IN.
LREF = .8000 IN. YMRP = .0000 IN.
BREF = .8000 IN. ZMRP = .0000 IN.
SCALE = .0056

PARAMETRIC DATA

BETA = .000 PHI = .000
FWDSTK = .000 AFTSTK = .000
ATMRNG = 1.000 ATMS = .000
CONFIG = 5.000 SHDSTK = .000
ELT = .000 SEPRKT = .000

RUN NO. 8/ 0 RN/L = 4.61 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CPB1	CPB2
2.740	189.930	-.63890	.70780	.06030	.08370	-.02690	-3.50790	.00000	.65030	.00000	.00000
2.740	188.030	-.46370	.72660	.04300	.03980	-.02170	-3.49620	.00000	.69430	.00000	.00000
2.740	185.990	-.29050	.57720	.03620	.01690	-.01660	-3.47790	.00000	.72460	.00000	.00000
2.740	183.990	-.15420	.40700	.00270	.04580	-.02940	-3.49200	.00000	.78160	.00000	.00000
2.740	181.970	-.08130	.27970	.02950	.01440	-.02330	-3.47580	.00000	.84890	.00000	.00000
2.740	179.930	.02340	.08830	.04160	.01270	-.03400	-3.47100	.00000	.25960	.00000	.00000
2.740	177.910	.12760	-.18810	.03620	.02120	-.03920	-3.48460	.00000	.68670	.00000	.00000
2.740	175.900	.18100	-.33730	.04720	-.03030	-.03750	-3.47840	.00000	.71860	.00000	.00000
2.740	173.920	.31690	-.48670	.01380	.03620	-.02950	-3.48130	.00000	.69180	.00000	.00000
2.740	171.880	.47330	-.61330	.01450	.02800	-.03110	-3.49620	.00000	.67220	.00000	.00000
2.740	169.940	.71980	-.63160	.05690	.04920	-.02540	-3.50660	.00000	.63910	.00000	.00000
2.740	179.980	.02370	.06670	.04240	.00180	-.03870	-3.47530	.00000	.33710	.00000	.00000
	GRADIENT	-.06399	.07785	.00051	.00149	.00043	-.00007	.00000	.03246	.00000	.00000

RUN NO. 8/ 0 RN/L = 6.28 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CPB1	CPB2
3.480	189.940	-.62380	.35800	.03660	.05490	-.02620	-3.45540	.00000	.61340	.00000	.00000
3.480	188.010	-.38140	.41880	.04300	.06350	-.03320	-3.46380	.00000	.65610	.00000	.00000
3.480	185.980	-.25300	.35850	.03630	.02330	-.02360	-3.45750	.00000	.68210	.00000	.00000
3.480	183.980	-.15900	.25970	.00430	.05110	-.02330	-3.45630	.00000	.59970	.00000	.00000
3.480	181.970	-.07490	.16090	.03860	.01160	-.02730	-3.44610	.00000	.74160	.00000	.00000
3.480	179.950	.00460	-.01620	.03200	.03120	-.00170	-3.44520	.00000	.85050	.00000	.00000
3.480	177.950	.03750	-.09540	.03310	.02980	-.02240	-3.45370	.00000	.77350	.00000	.00000
3.480	175.930	.13270	-.25380	.01030	.03740	-.03140	-3.45670	.00000	.72250	.00000	.00000
3.480	173.940	.22960	-.33240	.01110	.04640	-.03210	-3.46380	.00000	.69460	.00000	.00000
3.480	171.900	.39390	-.37030	.04340	.04590	-.03990	-3.46560	.00000	.64320	.00000	.00000
3 480	169.950	.60470	-.30910	.06510	.08570	-.02480	-3.46780	.00000	.60810	.00000	.00000
3.480	179.950	.02220	.00350	.04000	.02970	-.03910	-3.44920	.00000	.55340	.00000	.00000
	GRADIENT	-.05159	.04464	-.00034	-.00065	.00026	.00045	.00000	-.00003	.00000	.00000

MSFC 595(SA26F) 142-IN. SRB(138) NBRE18 (RS5054) (07 MAR 74)

REFERENCE DATA

SREF = .5030 SQ. IN XMRP = 5.5570 IN.
LREF = .6000 IN. YMRP = .0000 IN.
BREF = .6000 IN. ZMRP = .0000 IN.
SCALE = .0055

PARAMETRIC DATA

BETA = .000 PHI = .000
FLOSTK = .000 AFTSTK = .000
ATHRNG = 1.000 ATHS = .000
CONFIG = 5.000 SHDSTK = .000
ELT = .000 SEPRKT = .000

RUN NO. 7/ 0 RN/L = 4.05 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CNM	CLMM	CYM	CYNM	CBL	CA	CAB	XCP/L	CPB1	CPB2
4.959	189.880	-.30170	.18160	.00350	.15900	-.06210	-3.32480	.00000	.59610	.00000	.00000
4.959	187.680	-.39380	.39900	-.01500	.05010	-.02790	-3.31580	.00000	.64880	.00000	.00000
4.959	185.970	-.25100	.39780	-.01410	.00430	-.04740	-3.31550	.00000	.69580	.00000	.00000
4.959	183.970	-.17860	.22370	-.01410	.09050	-.06650	-3.32140	.00000	.66870	.00000	.00000
4.959	181.970	-.17720	.31020	.00470	.00410	-.04860	-3.30580	.00000	.70930	.00000	.00000
4.959	179.980	-.09960	.22000	.06290	-.12680	-.04090	-3.29640	.00000	.74670	.00000	.00000
4.959	177.940	.04070	.13100	.00890	-.08770	-.08710	-3.32970	.00000	.30420	.00000	.00000
4.959	175.950	.11690	-.00040	.08380	-.15080	-.05190	-3.30750	.00000	.56690	.00000	.00000
4.959	173.960	.15360	-.17700	.06740	-.13000	-.05140	-3.27710	.00000	.66950	.00000	.00000
4.959	171.940	.26040	-.12650	.06310	.00210	-.04010	-3.29140	.00000	.60680	.00000	.00000
4.959	170.010	.47160	-.12740	.00650	.08660	-.05540	-3.30950	.00000	.59860	.00000	.00000
4.959	179.960	-.10370	.22100	.00650	-.02070	-.09330	-3.32390	.00000	.74020	.00000	.00000
	GRADIENT	-.04332	.02740	-.00353	.00698	.00017	-.00134	.00000	.00422	.00000	.00000